

KENYA COLONY AND PROTECTORATE



MEDICAL DEPARTMENT  
ANNUAL REPORT  
1933

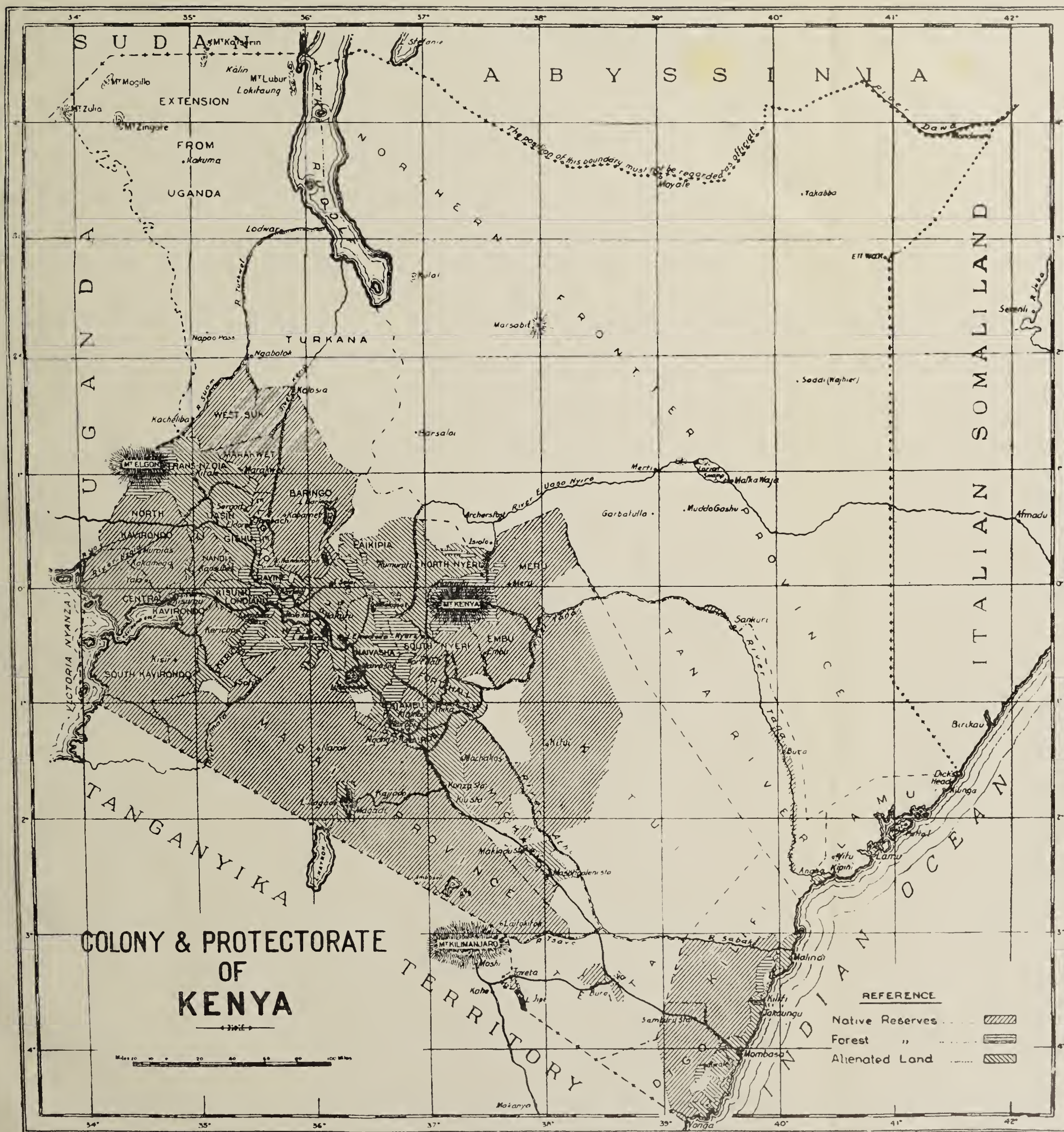
*INCLUDING THE*  
MEDICAL RESEARCH LABORATORY  
ANNUAL REPORT 1933

PRICE 5/-

NAIROBI  
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MEDICAL DEPARTMENT HEAD OFFICES,

NAIROBI.

SIR,

I have the honour to submit for the information of His Excellency the Governor, and for transmission to the Right Honourable the Secretary of State, the Medical Report on the Health and Sanitary Conditions of the Colony and Protectorate of Kenya for the year 1933, together with the Returns, etc., appended thereto.

I have the honour to be,

Sir,

Your obedient servant,

A. R. PATERSON,  
*Director of Medical Services.*

*The Honourable The Colonial Secretary,*  
*Nairobi.*





# CONTENTS

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MAP OF KENYA COLONY AND PROTECTORATE.— <i>Frontispiece.</i>	PAGE
---	------

DIAGRAMS—

Showing Proportion of Epidemic, Endemic, Infectious, Systemic and other Diseases as percentages of total cases treated at Hospitals and Dispensaries	9
Showing Proportion in Percentages of Epidemic, Endemic and Infectious Diseases In and Out Patients, treated at Hospitals and Dispensaries ..	10
Haemoglobin Estimations among the Masai and Wadigo by Age Groups ..	23

SECTION I. ADMINISTRATION—	1
----------------------------	---

Actual Expenditure in 1933 .. .. .	2
Changes in Departmental Organisation .. .. .	2
Organisation of Departmental Administration—Headquarters Administration and Organisation .. .. .	2
The Field Medical Services .. .. .	3
The Field Medical Services in the Native Reserves .. .. .	4
Secondary and Primary Health Centres .. .. .	4
Staff Changes during the year .. .. .	7
Financial .. .. .	8

SECTION II. PUBLIC HEALTH—	8
----------------------------	---

General Remarks .. .. .	8
The Factors that condition Health .. .. .	11
The Peasant's Budget.. .. .	12
The Health of a Pastoral Tribe—The Masai .. .. .	14
The Health of a Coastal Tribe—The Wadigo .. .. .	17
The Various Diseases causing Death .. .. .	21
Anaemia among the Wadigo .. .. .	22
Discussion of the Masai and Digo findings in relation to the state of the Public Health of the Colony as a whole .. .. .	25
(I) General Diseases .. .. .	29
Mental Health and Capacity in relation to Environment and General Disease .. .. .	31

(II) Communicable Diseases :

Mosquito or Insect Borne .. .. .	34
Malaria .. .. .	34
Blackwater .. .. .	34
Plague .. .. .	34
Trypanosomiasis .. .. .	34
Relapsing Fever .. .. .	35
Typhus .. .. .	35

*Infectious Diseases :—*

Pneumonia .. .. .	35
Smallpox .. .. .	35
Syphilis .. .. .	35
Yaws .. .. .	35
Tuberculosis .. .. .	36
Leprosy .. .. .	36
Enteric .. .. .	36
Dysentery .. .. .	36
Diphtheria .. .. .	36
Cerebro-spinal Fever .. .. .	36
Anthrax .. .. .	36
Undulant Fever .. .. .	36
Helminthic diseases .. .. .	36

VITAL STATISTICS :	PAGE
Estimated Population .. .. .	37
Registration of Births and Deaths.. .. .	37
Table showing Sick, Invaliding and Death Rates of European Officials during the last Three Years .. .. .	38
Table showing Sick, Invaliding and Death Rates of Non-European Officials during the last Three Years .. .. .	38
SECTION III. HYGIENE AND SANITATION—	
A.—General Review of Work Done and Progress Made .. .. .	38
(1) Preventive Measures .. .. .	38
<i>Mosquito and Insect Borne Diseases :</i>	
Malaria .. .. .	38
Trypanosomiasis .. .. .	38
<i>Epidemic Diseases :</i>	
Plague .. .. .	38
Smallpox .. .. .	39
Dysentery and Enteric Fevers .. .. .	39
Tuberculosis .. .. .	39
<i>Helminthic Diseases :</i>	
Ankylostomiasis, etc. .. .. .	39
(2) General Measures of Sanitation .. .. .	39
(3) School Hygiene .. .. .	39
(4) Labour Conditions .. .. .	39
(5) Housing and Town Planning .. .. .	39
(6) Food in Relation to Health and Disease .. .. .	40
Diet No. 1 Chart .. .. .	41
African Diet No. 1—Chart .. .. .	41
The Cost in Nairobi and England of the minimum diet .. .. .	43
B.—Measures Taken to Spread the Knowledge of Hygiene and Sanitation .. .. .	44
C.—Training of Sanitary Personnel .. .. .	44
D.—Recommendations for Future Work .. .. .	44
SECTION IV. PORT HEALTH WORK AND ADMINISTRATION .. .. .	45
SECTION V. MATERNITY AND CHILD WELFARE .. .. .	46
SECTION VI. HOSPITALS, DISPENSARIES, OUT-DISPENSARIES, VENEREAL CLINICS, THE MENTAL HOSPITAL, MEDICAL WORK CARRIED OUT BY MISSIONARY SOCIETIES, ETC. .. .. .	48
Hospital and Dispensary Policy .. .. .	49
Table of In- and Out-patients Treated at Hospitals, Dispensaries and Out-Dispensaries in Townships.. .. .	50
In Turkana, Northern Frontier Province and Lamu .. .. .	50
In Native Reserves .. .. .	50
Medical Training Depot .. .. .	51
Venereal Clinics .. .. .	61
Mathari Mental Hospital .. .. .	51
Medical Work Carried Out by Missionary Societies .. .. .	55
SECTION VII. PRISONS AND ASYLUMS .. .. .	56
SECTION VIII. METEOROLOGY .. .. .	58
RETURNS. TABLE I. Staff .. .. .	59
TABLE II. Financial .. .. .	59
TABLE III. Return of Statistics of Population .. .. .	61
TABLE IV. Meteorological Returns .. .. .	61
TABLE V. Return of Diseases (In-patients) .. .. .	63
TABLE VI. Return of Diseases (Out-patients) : .. .. .	79



# MEDICAL DEPARTMENT ANNUAL REPORT 1933

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## I.—ADMINISTRATION.

In the Annual Report for 1932 a short review was provided of the development of the administration of the Medical Department during the decade 1922-1933, a decade which commenced and ended in periods of depression. In that review it was noted that departmental administration throughout the decade had been consistently directed towards one object, the provision in an economical manner of an ever increasing measure of effective medical relief, sanitary direction, and instruction in hygiene throughout the Colony. It was noted also that the policy which had underlain that administration had been the same throughout the decade, namely, a policy of educating and encouraging African natives to play an ever increasing part in the work of the Department, that this policy had been uncommonly successful because as teachers, and leaders, and guides, Government had been able by various means to maintain an enthusiastic and highly trained European staff of medical officers, nursing sisters and sanitary inspectors, and furthermore, that as a direct result of the advancement of the African members of the staff we appeared in 1932 to be weathering, if not altogether without damage, at least without serious leeway, the waves of retrenchment and curtailment of expenditure against which for nearly two years we had then been labouring. In that Report the various factors which had enabled an enthusiastic and effective European staff to be maintained, and an efficient African staff brought into being, were detailed, the opportunity which followed from the establishment of a comparatively inexpensive staff, which was capable of being greatly expanded, was emphasized, and the chapter concluded with a note to the effect that, "The most important medical administrative problem of the moment is therefore to ensure that the various factors which conditioned opportunity in the past, and have resulted in a great economy to-day, remain unaffected in any vital manner through the period of financial restriction no matter how prolonged that period may be".

The year 1933, with which we have now to deal, though, like its predecessor, a year of depression, has been, so far as the Medical Department was concerned, one less of retrenchment than of reform. Financial restriction has continued it is true, and was even intensified, but the intensification was relatively small compared with the drastic measure of restriction which had been imposed during the year 1931 and 1932, while reform has been notable. It could hardly have been otherwise. The annual provision sanctioned for the service of the Department had already been reduced from £250,834 in 1930 to £219,357 in 1932, the actual recurrent expenditure from £236,934 to £197,260; the staff of medical and health officers had come down from 72 to 54, nursing sisters from 54 to 47, and sanitary inspectors from 22 to 16. By an early date in 1932 there was in fact but little opportunity left for further retrenchment, or restriction, to be imposed without completely wrecking the administration of the public health services of the Colony. That was the position which appeared to pertain in 1932; that it did actually so pertain was very clearly demonstrated in 1933, firstly, by the Expenditure Advisory Committee which having commenced its sittings in July, 1932, and considered among other matters the Medical Estimates for 1933, reported early in the latter year, and secondly by the Report of the Select Committee of Legislative Council which sat towards the end of 1933 to consider the Estimates for 1934.

The Draft Estimates of the Medical Department for the year 1933, as submitted for consideration by the Expenditure Advisory Committee of 1932, totalled £220,370, a sum which exceeded the Sanctioned Estimates for 1932

by little more than £1,000, or less than the sum of the normal annual increments of the staff. After a most complete examination of these Estimates the Expenditure Advisory Committee was unable to suggest an immediate reduction of more than £5,000 for 1933, or of more than £10,000 in subsequent years, and so lowering the Estimates of the Department to £215,000 for 1933, and to about £210,000 per annum thereafter. The Expenditure Advisory Committee was, however, as it noted, restricted by its terms of reference to the consideration of non-native services, and it therefore recorded its opinion that : "We feel that some attempt should be made to reduce the expenditure of the Medical Department to a considerably lower sum . . . "

#### ACTUAL EXPENDITURE IN 1933.

In 1932 the Sanctioned Estimates for medical services stood at a figure of £219,357, but partly as the result of departmental economies, partly as the result of general measures such as the moratorium on leave, and partly as the result of a budgeting method which makes it all but impossible to avoid a favourable difference between actual and sanctioned expenditure at the end of the year, the total actual expenditure was no more than £197,260. In 1933 with a revised sanctioned expenditure of £215,116 actual expenditure was £199,568, or £2,308 in excess of that for 1932.

This excess over the expenditure in 1932 was largely accounted for by the fact that in 1932 a moratorium on leave had been instituted which, while it avoided large expenditure on passages in that year, nevertheless entailed greater expenditure on this item in 1932. The actual expenditure on services rendered in the country was, therefore, very similar in each year.

We come now to the consideration of the changes effected in 1933 as a result of the recommendations of the Expenditure Advisory Committee.

#### CHANGES IN DEPARTMENTAL ORGANIZATION.

The first recommendation of the Expenditure Advisory Committee, was to the effect that "the organization of the Department into 'Medical' and 'Sanitation' Divisions be discontinued, and that the posts of Deputy Director of Medical and Deputy Director of Sanitary Services be abolished, and one post of Deputy Director of Medical Services be created in their stead. This will necessitate a change in the title of 'Deputy Director of Laboratory Services'." This proposal was made to the Expenditure Advisory Committee by the Department, which had long held the view that the reform involved was not only desirable but absolutely essential if efficient and economical administration of the medical services was to be achieved. The reform was, in practice, effected in March 1933, though this action was taken not as a result of the recommendations of the Committee but because certain staff changes, together with a general shortage of personnel, rendered such an alternative essential, if only as a temporary measure. Towards the end of the year, however, it was announced by the Secretary of State that on the 1st January, 1934, there would be established a single Colonial Medical Service, and that the nomenclature of the higher administrative posts in Medical Departments staffed from this service would be as follows :—

Director of Medical Services,

Deputy or Assistant Director of Medical Services.

This announcement should ensure that the reform which was recommended earlier in the year by the Expenditure Advisory Committee, and has been in operation from March onwards as a temporary measure, will be duly implemented.

#### THE ORGANIZATION OF DEPARTMENTAL ADMINISTRATION.

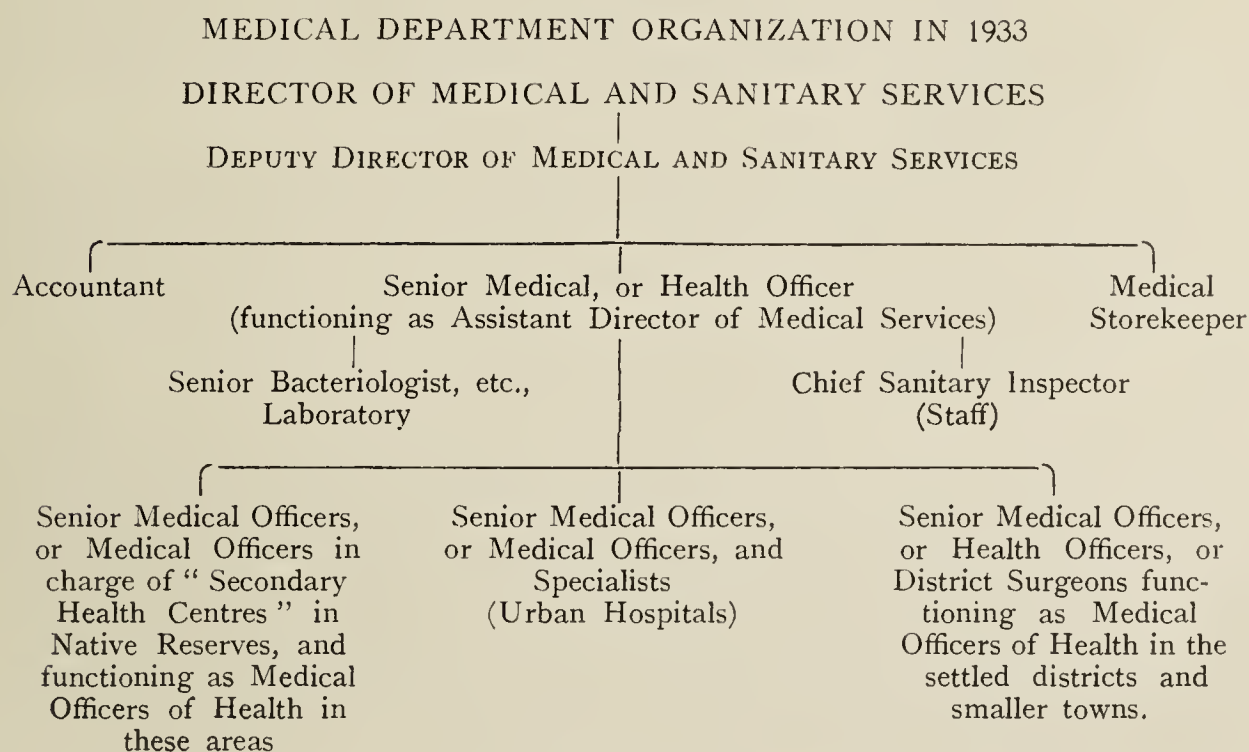
##### *Headquarters Administration and Organization.*

The attached diagram represents the organization of departmental administration which came into being early in 1933. As this organization is now an accomplished fact it is unnecessary to explain how it differs from that which



preceded it, or to do much more than to record the fact that the experience of the past nine months has proved it not only to be productive of economy but eminently satisfactory in every way. A few points, however, must be noted.

Firstly, with regard to touring: in a colony of the size of Kenya with many districts each presenting problems different from the others, and all more or less actively developing, it is of primary importance that all senior members of the headquarters staff should keep themselves informed as to local progress, and local needs. For this purpose the members of the central staff must travel, and they must travel sufficiently often and with a sufficiency of leisure to appreciate what they see. For this purpose a central professional headquarters staff of three is, in the case of a large colony and a large department, minimal. In 1933 with a headquarters staff of three, though a large majority of the medical stations were visited, some were not, and it was found to be impossible to complete the systematic programme of tours which had been prepared at the beginning of the year.



Secondly, it must be noted that though the position of the officer in charge of Laboratory Service is correctly indicated in the diagram which is given, it is not intended to suggest that this officer should necessarily be of lower rank than the Deputy Director of Medical Services. The Deputy Director of Medical Services so far as policy is concerned is a channel of communication, and in a colony of the size of Kenya the officer responsible under the Director of Medical Services for the direction of research and the organization of the Laboratory Service should, whatever his title may be, be an officer of experience and standing, and in receipt of a salary not less than that of the Deputy Director.

Lastly, there remains to be considered the administration of medical services in the field—the primary function of an executive medical department of public health.

#### *The Field Medical Services.*

In Kenya the local, or field, medical services, and the term is used here in its wider conception which includes both curative and preventive service, have developed along two lines. In the urban areas the responsibility for providing medical public health staff and preventive services is gradually being devolved on local representative authorities, which in some cases have undertaken also certain responsibilities in respect of curative services. In settled European farming districts, which on the whole are but sparsely populated, the responsibility for the former is still retained entirely by the State, while for curative services recourse is had, as a rule, to whatever provision there may be in the nearest town.

In the great, and in many cases comparatively densely populated, areas of the Native Reserves, on the other hand, a large medical organization has been built up, and here, because wealthy and experienced representative local authorities have yet to come into being, the responsibility for providing local medical services has been retained by the central Government in accordance with whose public health policy the Medical Department has organized and administers in these Reserves such services as the funds which are placed at its disposal have permitted.

*The Field Medical Services in the Native Reserves.*

The local medical service in the Reserves has been designed in accordance with the general administrative organization of the Colony, that is on a district basis, and in each district, so far as staff and funds have permitted, a district medical organization has been established.

The chief objects of these local services are three in number as follows :—

- (i) To advise the local public health authority, i.e. the District Commissioner, with regard to the promotion and safeguarding of the public health.
- (ii) To advise individuals with regard to hygiene and sanitation, that is, to engage in health propaganda and to endeavour to educate the community with regard to personal and domestic hygiene and sanitation.
- (iii) To provide medical relief.

With a view to the achievement of these objects, which clearly require for their fulfilment the closest of contact between the medical service and the community, the district medical organization of Kenya has for many years past been developed according to a system which has recently been given prominence in an important publication of the Health Organization of the League of Nations\*—the system of a central, or “Secondary” Health Centre in each district governing and working through a series of subsidiary, or “Primary” Health Centres.

*The Secondary and Primary Health Centres.*

*The Secondary Health Centre.*

In each Administrative District in the Native Reserves with but few exceptions there is now established at the Administrative headquarters, unless where for some particular reason, usually connected with the density of the population, another site has been chosen, a central, or “Secondary” Health Centre. Such a secondary centre may comprise :—

- (a) One, or two, Medical Officers.
- (b) An European Sanitary Inspector.
- (c) A hospital of from thirty to one hundred beds.
- (d) One, or two, European Nursing Sisters.
- (e) Simple laboratory facilities.
- (f) A Motor Ambulance.
- (g) African Hospital Assistants.
- „ Laboratory Assistants.
- „ Sanitary Assistants.
- „ Dispensers.
- „ Health Workers.

---

\*“European Conference on Rural Hygiene. Recommendations on the Principles governing the Organization of Medical Assistance, the Public Health Services and Sanitation in Rural Districts.” League of Nations, Geneva, 1931.



In the larger districts with populations of anything between 100,000 and 300,000 persons the centre may, and where possible should, be under the charge of a Senior Medical Officer, and in such cases the medical staff should, if possible, be larger than two. Unfortunately, for the moment, the provision of more than two medical officers at any centre is out of the question. Of the officers appointed to the centre the senior acts as Medical Officer of Health, or public health adviser to the local authority of the district, that is to the District Commissioner. For technical advice in certain fields of what is usually termed "sanitation" the Medical Officer of Health can if need be refer to his Sanitary Inspector, but on the broader issues of public health policy he should always be able, even though his leanings are towards clinical work, to provide sound advice out of that general experience which should always go with seniority.

#### *The Primary Health Centre.*

The secondary health centre which has just been described in outline while it might, if its hospital were large enough and its motor transport system adequate, be able to afford a large measure of indoor medical relief for the more serious cases of illness which might occur among a large population over a very extensive area, could not of itself provide outdoor relief for minor sickness, nor undertake intensive work with regard to the education of the people in hygiene, and the improvement of their sanitary conditions, *except in its immediate neighbourhood*. But of even greater importance than the relief of sickness is its prevention, and with the latter object in view both doctors, and nurses and midwives, as well as health visitors and sanitary inspectors, must come into the most intimate contact with the people *in their own homes* practically from day to day; and if the behests of these workers are to carry weight, and if their advice is to be accepted they must know and be known by the people; and the advice must be given day after day until it is accepted; and, when it has been accepted, the folk must be visited still almost from day to day if it is to be acted upon without loss of time, or effort, or money on the part of the people. And so medical workers must live among the people in all quarters of the area to be served; and they must be sufficient in number, and so posted that there is intimate and easy contact between the whole of the personnel of the medical service and the folk of the countryside. Peasants cannot afford to travel far, either to receive treatment, or to learn. Facilities for treatment must, therefore, be brought almost to their doors, while teaching must be taken actually over their doorsteps. For these purposes the primary health centres have been established.

Up till recently our primary health centres were little more than dressing stations where simple injuries could be attended to, and simple remedies dispensed; and the accommodation was of the poorest. Latterly there has been advance. The Local Native Councils have built many good dispensary buildings and provided good houses for the dispensary dressers. The type of dresser has improved, and the Jeanes School is now training health workers for us who will go out into the villages to teach, and to demonstrate in the most practical fashion possible, more sanitary methods of living. The dispensary from being no more than a place where ulcers, to take only one example, were treated, is becoming a centre from which the *methods of preventing the occurrence of ulcers* will be taught to the surrounding population. At many centres now there is also some simple accommodation where the more seriously sick may remain for a few days pending their evacuation by motor transport to the hospital at the secondary centre, and at two primary centres there are now in addition African midwives, and some accommodation for maternity cases. All primary centres except a few are visited at least once a month by the medical officer, both with a view to diagnosing and providing treatment for more serious cases, and with the object of supervising and directing the local health campaign.



The amount of this work, bearing in mind the numbers of our staff, has not been small, and indeed it would be ungracious to the staff, whether African, Asian or European, which has carried it out often under difficult circumstances but always with enthusiasm, not to record my opinion that so far as staff and funds have allowed the public has been most efficiently and loyally served. But compared with the needs of the population the amount of service provided is still meagre. As has been shown in these Reports on many occasions the African population of Kenya is far from being a fit one, it is far indeed from being as fit as the peasantry of Europe, and as regards a knowledge even of the most elementary laws of hygiene it is more backward even than they.

There is, therefore, much to be done in Kenya, both in the way of the provision of medical relief and the provision of instruction. For these purposes in Europe it was the opinion of the European Conference on Rural Hygiene, which was held under the auspices of the Health Organization of the League of Nations at Geneva in 1931, that the following provision was required :—

- 1 hospital bed per 400 or 500 persons.
- 1 physician per 1,000 or 2,000 persons.
- 1 District Nurse per 1,000 or 2,000 persons.
- 1 Medical Officer of Health per 50,000 persons.
- 1 Public Health Nurse per 6,000 to 8,000 persons.
- 1 Sanitary Inspector per 50,000 persons.

In Kenya, when in 1927, a ‘‘Health Scheme for the Native Reserves’’ was drawn up by the Medical Department and approved by Government in the following year as representing a ‘‘framework’’ which when fully developed might meet the needs of the people, the standards which were adopted as the objects of this *first step* were as follows :—

- 1 hospital bed per 1,000 persons.
- 2 Medical Officers per 100,000 persons.
- 1 Medical Officer of Health per 100,000 persons.
- 1 Sanitary Inspector per 100,000 persons.

That was our immediate ideal in 1927. How far we had progressed towards it by 1933 is shown in the following table :—

Table showing the number of hospitals, beds and medical and nursing staff in the *Native Reserves* of Kenya in various years compared with the provision suggested in the ‘‘Health Scheme’’ of 1927

	1918	1925	1931	1932	1933	The provision suggested under the ‘‘Health Scheme’’
Hospitals .. .. .	5	5	16	16	16	29
Beds .. .. .	150	252	656	831	866	1,911
Medical Officers and Medical Officers of Health .. .. .	3	6	19	22	20	44
Nursing Sisters .. .. .	—	—	11	9	9	44
Sanitary Inspectors .. .. .	—	—	6	6	6	12

The medical services provided by Government in 1933 entailed an expenditure on drugs, dressings, hospital treatment, medical administration, maritime quarantine, laboratory investigation, health propaganda, and health education for all communities of almost 1/4d. per head of the population for the twelve months, or, say, 5/- per family per annum. On a monthly basis the expenditure was about 1¼d. per individual or 5d. per family per month.

If the complete 'Health Scheme' were to be in operation the cost would be about doubled, that is to say it would be about 2/8d. per individual, or 10/- per family per annum, or 10d. per family, or 2½d. per individual per month. These charges, even if they did not include the cost of all preventive and health services would hardly represent high doctors' bills, and if it be true, as it undoubtedly is, that the higher of these charges is impracticable at present, and the lower the maximum that the people can afford for medical relief and education in hygiene, the reason is not far to seek why so many are ill. Where poverty is so dire as it is generally in the tropics, and as the Expenditure Advisory Committee has very rightly held it to be in this Colony, it is, from one point of view at least, a matter of but little importance if in any particular year the staff available for the administration of the medical service is less by a medical officer, or a sanitary inspector, or a few clerks, than in another. But if the findings of the Expenditure Advisory Committee be duly considered and correctly interpreted then that body will have rendered a great service, for its findings so interpreted indicate in the most unmistakable manner, at least so far as public health administration is concerned, the road to reform.

Such in broad outline is the organization of the medical service which to-day has to be administered at an annual cost of about £200,000.

In the following chapters of this Report some indication will be given of the state of the public health of the population which has to be served, and of the needs of that population with regard to education in hygiene and for medical relief.

#### STAFF CHANGES DURING THE YEAR.

The following reductions in staff took place during the year :—

Senior Health Officer	...	...	...	...	1
Medical Officer	...	...	...	...	1
Laboratory Assistant	...	...	...	...	1
Clerks—European	3				
Asian	2	...	...	...	5

The following are the principal appointments, promotions and changes made during the year :—

- (1) A. R. Paterson to be Director of Medical and Sanitary Service on the retirement of J. L. Gilks, 3rd November, 1933.
- (2) F. J. C. Johnstone to be Deputy Director of Medical Services from 5th September, 1933, *vice* A. D. Williams transferred to Nyasaland on promotion to Director of Medical and Sanitary Services.
- (3) W. H. Kauntze, Deputy Director Laboratory Service, transferred to Uganda, 9th March, 1933, on promotion to Director of Medical and Sanitary Services.

#### *Resignations.*

Medical Officers	...	...	...	...	2
Nursing Sisters	...	...	...	...	2

#### *Appointments Terminated.*

Senior Health Officer	...	...	...	...	1
Nursing Sister	...	...	...	...	1
Male Nursing Orderly	...	...	...	...	1
Clerks—European	3				
Asian	1	...	...	...	2

#### *Transfer (to Agricultural Department).*

Laboratory Assistant—European	...	...	...	...	1
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## LEGISLATION.

No ordinances primarily affecting the public health were enacted during the year.

## FINANCIAL.

The total of the sanctioned estimates for the Medical Department for the year 1933 was £215,166, a decrease of £4,391 on the previous year, and the actual expenditure during the year amounted to £199,618, viz. £15,548 below the sanctioned estimates.

The comparative table of the sanctioned estimates and expenditure of the Medical Department for the past three years is as follows :—

YEAR	Sanctioned Estimates	Sanctioned Extraordinary Estimates	Total Sanctioned	Actual Recurrent Expenditure	Actual Extraordinary Expenditure
1931 ..	£ 252,061	£ 1,638	£ 253,699	£ 221,202	£ 1,696
1932 ..	219,357	400	219,757	197,260	393
1933 ..	215,116	50	215,166	199,368	50

The revenue collected amounted to £17,597, against £18,748 in 1932.

Of the total estimated expenditure in 1933 of £3,222,210 for the Colony and Protectorate £215,166 represented expenditure on Public Health and Medical Relief, a ratio of 1 to 14.97 or 6.68 per cent.

Detailed returns of the revenue and expenditure are given in Table II at the end of the Report.

## II.—PUBLIC HEALTH.

## GENERAL REMARKS.

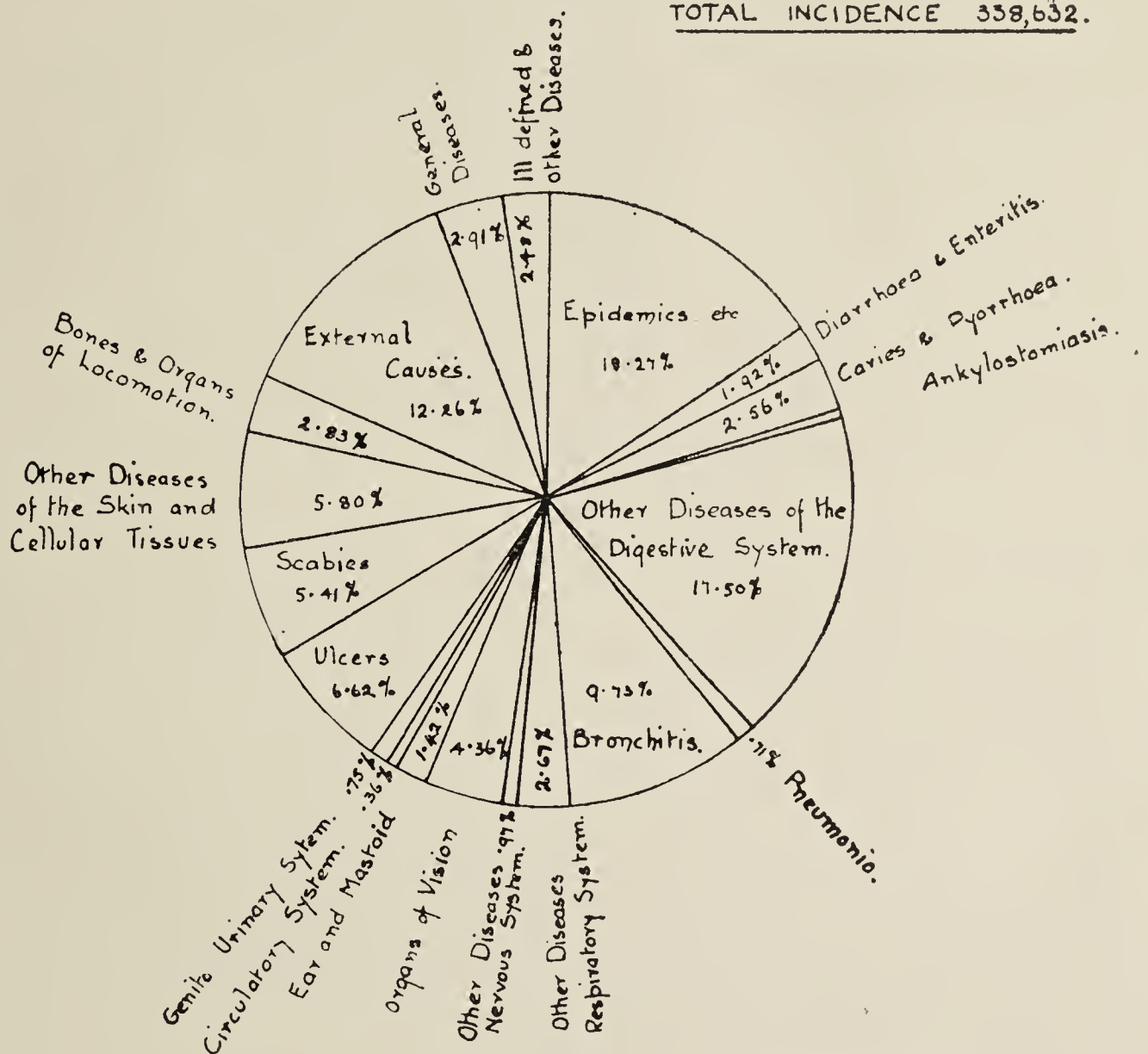
In the Annual Report for the Colony for 1932 the question of the method of estimating the state of the public health in any area populated chiefly by “backward peoples”, and of estimating the extent and direction of the changes which might take place from year to year was discussed at some length, and it was indicated that with these objects in view it was, in the absence of precise general records, essential that any general conclusions at which we might be tempted to arrive should always be reviewed in the light of the results of more detailed local surveys. In the course of the argument then advanced it was demonstrated in the first place that an absence of a high incidence of the more spectacular and well known epidemic diseases such as smallpox and plague was not of necessity evidence of good health, in the second place that no great volume of precise data with regard to the general population was at our disposal, and thirdly that with regard to the only large rural coastal area, namely, the Digo District, in respect of which we had any detailed vital statistics the data available was not such as to allow us to presume that generally speaking the state of the public health in the coastal lowlands was satisfactory.

Of the public health of the Colony in 1933 as compared with the public health in 1932 there is little to be said, since in 1933 as in 1932, and as will be the case for a good many years to come, accurate data with regard to general mortality and invalidity are still lacking. It would therefore be unwise to say more than that while in 1933 just as in 1932 no very unusual epidemic outbreaks of disease occurred, that while in 1933 just as in 1932 only an insignificant mortality was due to plague and none to smallpox, and while there is perhaps some reason to suppose that the incidence of yaws is still, as we thought in 1932, decreasing, yet we have no reason to suppose that either pneumonia or malaria were less dire in their effects, intestinal worms less universal, ulcers less common, or the people appreciably better nourished in 1933 than in the preceding year.

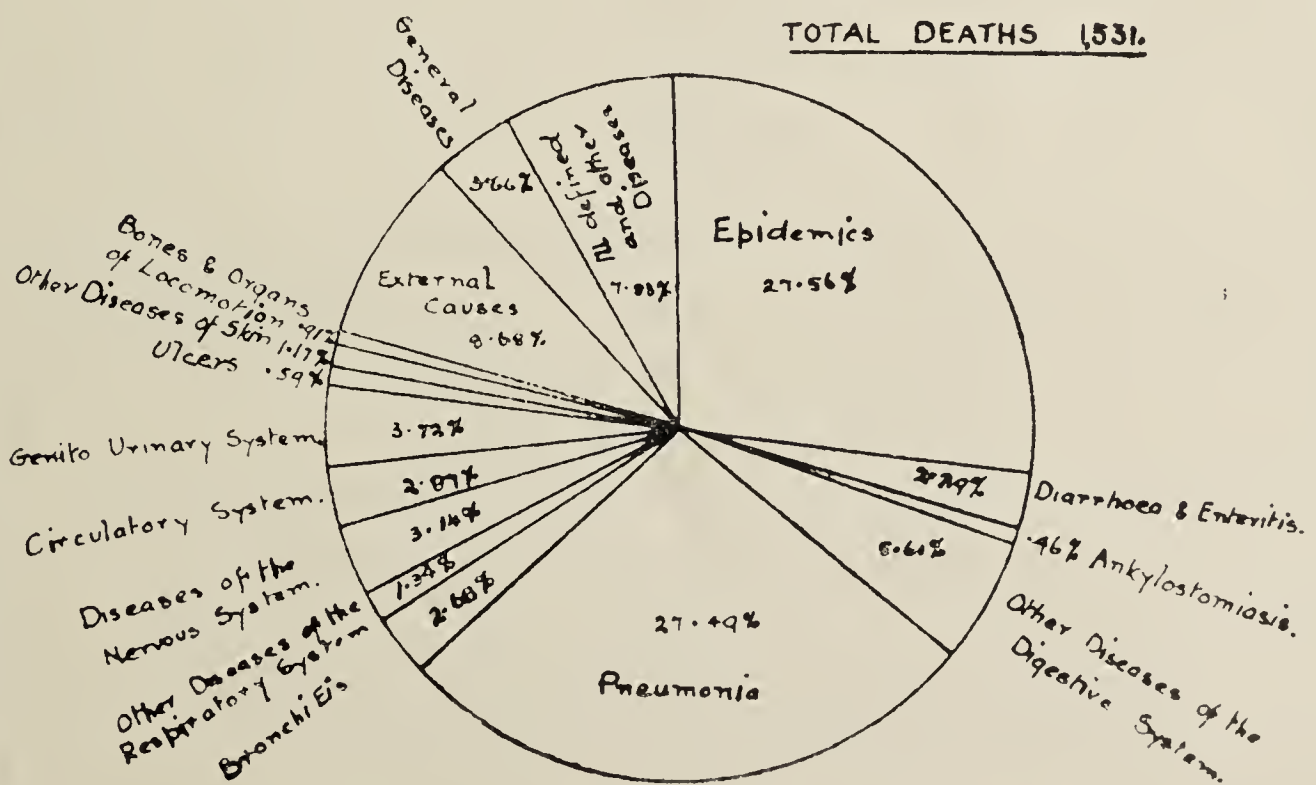


The Proportion of Epidemic, Endemic, Infectious, Systemic and other Diseases shown as percentages of Total Cases treated at Hospitals and Dispensaries.

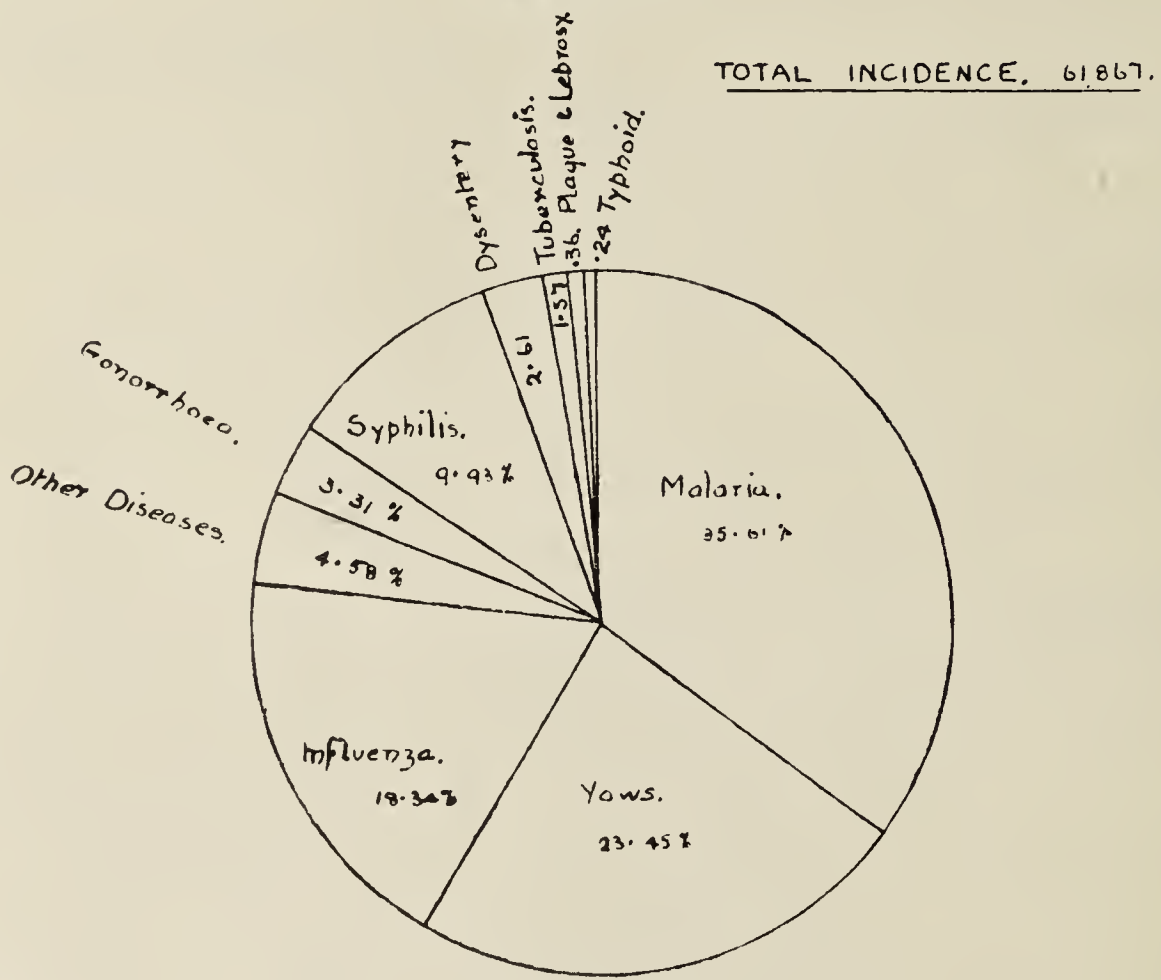
TOTAL INCIDENCE 338,632.



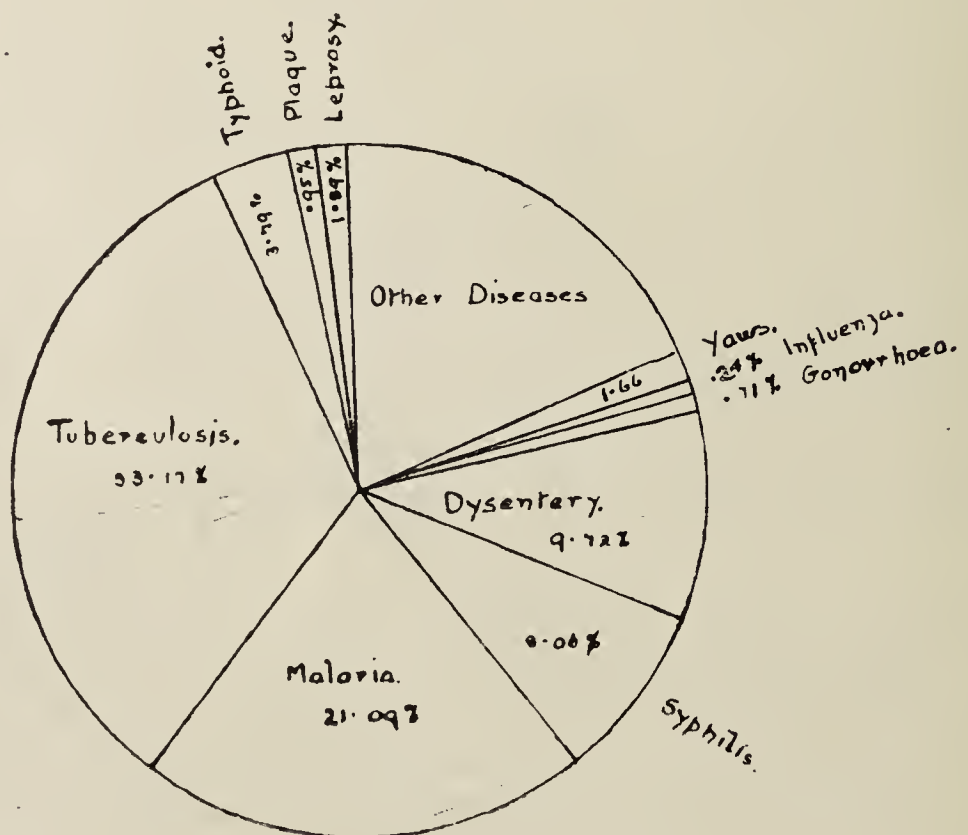
TOTAL DEATHS 1531.



Proportion in Percentages of Epidemic, Endemic and Infectious Diseases, In and Outpatients, treated at Hospitals and Dispensaries.



TOTAL DEATHS, 422.



But if a report on the public health is to serve, as it should serve, its essential purpose of enabling the executive Government to determine a line of policy which will lead to the production of an A1 population something more definite is required of its Medical Department than a statement that the public health is certainly poor, and might well be better. Very clearly it is for the Medical Department of Government to determine not merely how good, or bad, the people's health may be in any particular year, but, if it be bad, to indicate why it is bad, and, if it can, to prescribe a remedy.

This is the 33rd Annual Report to be written on the health of the population of the territory now known as Kenya since the Uganda Railway first reached Nairobi and established easy communication between a large inland area of Africa and the sea. Thirty-three years ago trade, so far as most of our three millions of population are concerned, first began to be possible, and for the first time easy communication with Europe, and with European culture, was established. In the interval many changes have taken place throughout the territory, and, though on this point it would be unwise to be dogmatic, possibly the health of the people has improved. Be this as it may, of two things at least we can be sure, firstly, that a high standard of health in the near future ought not to be an impossibility, and, secondly, that nothing approaching even a moderately good average standard of health has yet been attained.

In support of the opinion that the health of the native peoples of Kenya is not yet good some very definite evidence was advanced in the Annual Report for 1932 when the condition of the people of the large coastal district of Digo was discussed at length, and later in this section of this Report the story of these people will be brought up to date, while very similar evidence will be advanced with regard to another important tribe, namely, the Masai, who occupy a very different type of country in the highlands. But the problem of the remedy must also be considered, and to-day when financial restriction prevents almost entirely the more extensive application of any of the conventional remedies which have hitherto been tried, and it is still perhaps uncertain whether we have yet passed the nadir of depression, when everyone is turning with one accord to determine if possible the causes of depression, the methods of removal, and the methods of preventing a recurrence, when in fact methods of reconstruction are the object of all endeavour, and when the maintenance of the people in health is beginning to be more generally appreciated as one of the issues at stake, and a matter of no small economic importance, it might be of service to consider why after three decades of contact with Europe the peoples of Kenya are still far from physically fit.

If there be a relation between health and prosperity it should be of interest to determine with precision the laws which govern the relation.

The easiest approach to this question is perhaps by means of another : what are the factors that condition health?

#### THE FACTORS THAT CONDITION HEALTH.

The primary factors conditioning health are perhaps five in number :—

1. Knowledge of the elementary rules of hygiene.
2. Good food.
3. Good water supplies.
4. The means of cleanliness, and among these a good house.
5. An interest in life.

These are large subjects, but it may be of service to outline at least roughly some of their implications.

Firstly, with regard to a knowledge of the elementary rules of hygiene ; good health in adult life is clearly to no small extent dependent on care in infancy and in childhood. What then is the lot of the African child? *The*



lot of from 10 per cent to, in some areas, even 40 per cent of African infants is to die before they reach the age of one year. Why? Our experience suggests that this mortality is largely the result of maternal ignorance. And where large numbers of the children die in infancy what of the survivors? Are the survivors likely to have had a good start in life? That is not our experience. The survivors, almost without exception, are more or less seriously damaged during infancy and childhood as the result either of disease, poor feeding, or poor care. Is, therefore, "maternal instinct" ever likely to be enough to ensure healthy childhood in Africa? There can only be one answer to that question: and so it would seem that the education of the girlhood of Africa, and their guidance during motherhood is required. How much education, and how much guidance? We cannot go into the details of the question here, but we may ask, is it likely that less will suffice in Africa than is necessary in Europe, that is, education from the age of six to sixteen years, and much guidance afterwards? If so, what would the cost be? Thirty-five shillings per child per annum would be a low figure even for the most elementary education. Can the African afford a cash outlay of this magnitude when, as we have seen, he cannot afford 2½d. per head per month for medical attention? But it is not a less difficult task to ensure the health of a child in a smoke-begrimed grass hut than in a clean nursery, without a water supply than with one, and the education of girls is a necessity even in England. So much with regard to the cost of providing some education for African girls who are to be mothers later on. But more than education is required: good food, good water supplies, the means of cleanliness, soap and good building materials are all required as well, and all will in most cases entail some cash expenditure, for in few places, and very certainly not in Africa, can all these things be found at the peasant's doorstep, or grown by each peasant on his own land. In Africa, therefore, as elsewhere, we come inevitably to the consideration of a matter which can never be ignored in dealing with questions of rural health, namely, what the peasant's budget ought to be, and the income he may have to meet it.

#### THE PEASANT'S BUDGET.

Everywhere throughout the world the peasant's health is conditioned by, among others, two chief considerations:—

- (i) what he can grow for the use and consumption of himself and his family, and
- (ii) the extent to which his cash income can meet his, and his family's other needs.

What then does the African peasant need if he and his family are to be healthy? For example, does he need clothes? This question is an important one, though less for purely health reasons than as a test question the answer to which may provide an answer to others. The answer in this case is, that whether the African needs clothes, or not, he is going to have them: for two reasons; firstly because he desires them, and, secondly, because both Manchester and Japan are determined to provide him with them. So far therefore as the African, the health officer, and the statesman are concerned, the issue now lies not between clothes and no clothes, nor between clothes and skins, but between clean clothes and dirty clothes. Clean clothes mean soap, and a house in which clothes may be kept clean, that is a house with windows, and reasonably high walls; and such a house is necessary also if the family is to have fresh air at night. And if the children are to be looked to at night. And if the children are to be looked to at night, lamp oil is necessary. But if children are to be kept reasonably clean many more things are necessary. To take a simple example, *napkins and safety pins are prime essentials in the interests of cleanliness, and both cost money.* And if a well-balanced dietary is to be provided, and, if that monotony of dietary which is probably as objectionable in Africa as elsewhere is to be avoided, some foodstuffs will require to be purchased. Lastly, as we have seen, the peasant will require to provide some better form of education for his children than they get at present.

Below there is given a hypothetical budget which, though it makes no provision for education save from a hut tax of twelve shillings, might ensure a fair measure of health for a family, that is, if it yet be the case that the peasant can produce on his own holding the things which it is suggested he should not buy, and if his wife knew something of the management of children.

#### A PEASANT'S BUDGET FOR A FAMILY OF FOUR.

(Two adults and two children.)

The budget given below has been prepared on the supposition that the following foodstuffs, or their equivalents, can be produced by the peasant on his own holding :—

Potatoes, eggs, fowls, maize,  $\frac{1}{2}$  gallon milk daily, beans, peas, and green vegetables and fruit as required.

The family may be estimated to require in addition, however, the following foodstuffs :—

	<i>Sh. cts.</i>
<i>Per month—</i>	
Meat, 3 lb. weekly at 25 cents per lb. ... ..	3 00
Tea, 2 lb. monthly at Sh. 1 per lb. ... ..	2 00
Sugar, 3 lb. weekly at 25 cents per lb. ... ..	3 00
Salt, say ... ..	1 00
	<hr/> Sh. 9 0
Also Lamp Oil, one gallon per month ... ..	2 50
	<hr/>
	<i>Sh. cts.</i>
<i>Per annum—</i>	
Total of above Expenditure ... ..	138 00
And for clothing, etc.—	
For the man, 3 suits khaki, at Sh. 10 ... ..	30 00
For the wife 3 dresses print at Sh. 8 ... ..	24 00
For the two children, 2 dresses each, khaki, at Sh. 4 ... ..	16 00
For all, shirts, etc. ... ..	40 00
Blanket, one per annum ... ..	15 00
Sheets, towels, soap, etc. ... ..	80 00
Household replacements ... ..	18 00
Hut Tax ... ..	12 00
Local Native Council Cess at Sh. 1 ... ..	1 00
	<hr/>
<i>Grand Total ...</i>	<i>374 00</i>
	<hr/>

or £18/14/00 per annum.

So much for the budget; there remains the question of income. Is the income of the average peasant in Kenya equal to balancing the budget we have prepared? There is, unfortunately, no doubt as to the answer to this question, for, though it is impossible to say precisely what the average family cash income of the African peasant in Kenya may be, it can be said with certainty that it is not yet £5 per annum, while over more districts than one cares to think even twelve shillings are hard to come by.

The position of the average peasant family is, therefore, as follows :—

- (a) that they cannot produce on their own holding all the various foodstuffs which they require for the maintenance of health, and,



- (b) that while for the maintenance of fairly healthy home conditions a minimal cash expenditure of at least £18 per annum would appear to be necessary on additional food supplies, and on the "means of cleanliness", the available income falls short of such expenditure by at least £13, perhaps by much more.

In these circumstances a high standard of public health is unattainable for neither cleanliness nor good feeding are attainable; poverty and ignorance stand clearly in the way. The remedy stands equally clear. To suggest how the remedy should be applied lies in this case outside the province of the medical officer of health, though from his experience, firstly as a doctor, and secondly as a sanitarian he may recite two facts, namely, that one major cause of ill-health in the African is a poor dietary, and, that another is insanitary conditions resulting from insanitary and wasteful farming. If the African were a good crop farmer and a better animal husbandman, these great primary causes of ill-health would be to a large extent removed, and he might even be on the way to being able to purchase the means of cleanliness; and by no other means can they be removed than by the education of the African peasant to be a better farmer than he is to-day. But the remedy if it is to be effective as a public health measure must be applied on a major scale.

#### THE HEALTH OF A PASTORAL TRIBE.

The question of the standard of public health prevailing among the pastoral people of Kenya has not previously been dealt with in any Animal Report for the Colony, and perhaps no better illustration of the truth of the thesis advanced in the preceding paragraphs could be given than by shortly recounting the results of a health survey of one of these tribes, namely, the Masai, which was carried out in 1931. The fact that this survey was made nearly three years ago is for our present purposes unimportant, for though there may during these years have been some temporary regression as the result of drought and the destruction of grazing by locusts, these are vicissitudes of a kind which are little short of commonplaces of life in Masailand, and as the essential environmental factors which bear on the people's health have not been altered in the past three years there is no reason to suppose that a survey made to-day would yield very different results from that which was made three years ago.

The survey, the results of which have now to be summarized, was carried out during the period November 1930 to April 1931; it was made by a medical officer detailed for the purpose and all parts of the Masai Reserve were visited.

Masailand is a great block of country about 15,000 square miles in extent and comprises mountains, hills, and wide rolling plains. The average elevation of the country is about 5,000 feet. Some parts of the country are well watered and very fertile, but great stretches, though affording good grazing in the rains, are at other times only poorly watered. The climate varies from place to place: in some parts of the country it is, at least at night and in the mornings, cold and bracing, elsewhere it is hotter, but nowhere is the climate humid. Taking Masailand as a whole it is a fine country with a fine climate, its only drawback some lack of permanent waters.

The people number about 50,000, and the large majority are semi-nomadic, living by and on their large herds of cattle, sheep, and goats, and, as the grazing or the water fails, moving from time to time from place to place. Only a very few have taken to agriculture and settled permanently in one place. The Masai as a whole are still rather a primitive people living under conditions which, save for the absence of raiding and war, are but little different from those which have pertained for generations past. The people live in family communities of villages varying in size from about a hundred huts downwards. Living as they do in the midst of carnivores ready to prey on their stock they encircle the villages with high barriers formed of piled branches of thorn trees. During the rains the central area of the great thorn enclosure becomes a quagmire of mud in which the cattle flounder



belly deep. Even in the dry season there is more dung deposited during the night than can be thoroughly dried out during the day, and myriads of flies are bred therein. Inside this enclosure is a circle of low crude huts of wicker plastered with cow dung. In the huts there is refuge from the flies till the smoke-laden air drives one with streaming eyes once more out into the sunlight.

The people are brave, and, on the whole, intelligent, and some of the young men are fine specimens of humanity. What of the majority? Records were kept of the examination of 4,845 Masai comprising 648 older men, 348 warriors or "Moran", 1,460 adult females, 1,255 male children, 1,001 female children, and 133 babies. These records are summarized in the following tables.

NOURISHMENT POPULATION MASAI PROVINCE

Nourishment	VARIOUS AGE AND SEX GROUPS						
	Adult Males	Moran	Adult Males and Moran	Adult Females	Male - Children	Female Children	Babies
Good	<i>Per cent</i> 50	<i>Per cent</i> 84.5	<i>Per cent</i> 63	<i>Per cent</i> 61	<i>Per cent</i> 49	<i>Per cent</i> 73	<i>Per cent</i> 86
Fair	46	14	34	35	48	25	13
Poor	4	1.5	3	4	3	2	1

HÆMOGLOBIN ESTIMATION MASAI PROVINCE

Numbers Examined			Average Percentage Hæmoglobin of Various Age and Sex Groups							
Adults	Children	Total	Adults	Children	Adult Males	Adult Females	Moran	Male Children	Female Children	Babies
2,456	2,389	4,845	<i>Per cent</i> 81	<i>Per cent</i> 77	<i>Per cent</i> 79	<i>Per cent</i> 80	<i>Per cent</i> 91	<i>Per cent</i> 77	<i>Per cent</i> 78	<i>Per cent</i> 64

MASAI

Not Definitely Anæmic having Per cent Hæmoglobin over 80					Definitely Anæmic having Per cent Hæmoglobin under 70				
Percentage of the Total					Percentage of the Total				
<hr/>					<hr/>				
<i>Per cent</i>					<i>Per cent</i>				
Adult Males	..	..	151	or 23	Adult Males	..	..	16	or 2·5
Moran	..	..	304	„ 87	Moran	..	..	1	„ 0·3
Adult Male and Moran	..	..	455	„ 46	Adult Male and Moran	..	..	17	„ 1·7
Adult Female	..	..	552	„ 38	Adult Female	..	..	46	„ 3
Male Children	..	..	209	„ 17	Male Children	..	..	99	„ 8
Female Children	..	..	213	„ 21	Female Children	..	..	94	„ 9
Babies	..	..	0	„ 0	Babies	..	..	92	„ 69

CHILD MORTALITY—MASAI PROVINCE-  
BASED ON THE ANSWERS ON INTERROGATION OF MARRIED WOMEN

			Remarks
Number of married women interrogated (recently married women not included)	907		
Number of births recorded including mis- carriages .. .. .	3,105		
Average number of births per woman ..	3.4		
Total number of miscarriages .. ..	288		
Total number of women with history of—			
Miscarriage .. .. .	223	25%	} Possibly represents gonorrhœal history.
One Miscarriage .. .. .	179	20%	
Two miscarriages .. .. .	32	4%	
Three miscarriages .. .. .	6	1.3%	} Possibly represents syphilis history.
Four miscarriages .. .. .	4		
Five miscarriages .. .. .	1		
Six miscarriages .. .. .	1		
Total number of women childless, possibly sterile .. .. .	102	11%	Newly married childless women not included.
Total number of women possibly sterile from miscarriage .. .. .	211	23%	The usual history obtained was no children after miscarriage.
Total number of women possibly sterile..	313	34%	
Total number of deaths including mis- carriages .. .. .	1,548	per 1,000 499	
Total number of deaths not including miscarriages .. .. .	1,260	per 1,000 447	
Total number of women with history of family of seven or over .. ..	122	13%	
Total number of women with history of family of ten and over .. .. .	42	4.6%	Two very large families were 15 and 20. The latter could not be vouched for and is not included.

RESPIRATORY DISEASES—MASAI PROVINCE  
PERCENTAGE AFFECTED

SECTIONS MASAI	ADULTS				MORAN				CHILDREN			
	Bronchial Catarrh	Bronchitis	T.B.	?T.B.	Bronchial Catarrh	Bronchitis	T.B.	?T.B.	Bronchial Catarrh	Bronchitis	T.B.	?T.B.
	<i>Per cent</i>	<i>Per cent</i>	<i>Per cent</i>	<i>Per cent</i>	<i>Per cent</i>	<i>Per cent</i>	<i>Per cent</i>	<i>Per cent</i>	<i>Per cent</i>	<i>Per cent</i>	<i>Per cent</i>	<i>Per cent</i>
Lodokilani ..	11	7	2	8	10	—	—	—	5	5	—	—
Kisongo ..	27	3	3	2	33	1	7	3	26	3	3	3
Kaputie ..	33	2	3	5	46	3	—	3	35	4	1	4
Purko ..	30	1	2	1.5	20	—	—	—	32	3	1	2
Loita ..	40	4	0.4	0.8	23	—	—	—	30	—	—	1

EPIGASTRIC PAIN—MASAI POPULATION  
PERCENTAGE AFFECTED

Sections Masai	Adults	Moran	Children	Remarks
	<i>Per cent</i>	<i>Per cent</i>	<i>Per cent</i>	
Lodokilani .. ..	8	—	1	Complained of voluntarily.
Kisongo .. ..	5	1	0.5	
Kaputie .. ..	13	5	—	
Purko .. ..	44	23	7	Elicited on in- terrogation.
Leita .. ..	59	35	10	

## CONDITION OF TEETH AND GUMS—POPULATION MASAI PROVINCE

SECTIONS, MASAI	ADULTS		MORAN		CHILDREN	
	Caries	Pyorrhœa	Caries	Pyorrhœa	Caries	Pyorrhœa
	<i>Per cent</i>	<i>Per cent</i>	<i>Per cent</i>	<i>Per cent</i>	<i>Per cent</i>	<i>Per cent</i>
Lodokilani .. ..	4	59	—	30	1	10
Kisongo .. ..	7	65	—	23	0·5	18
Kaputie .. ..	1·4	69	—	35	—	18
Purko .. ..	1·5	61	—	17	0·2	10
Loita .. ..	—	60	—	16	—	8

## VENEREAL DISEASE—MASAI PROVINCE

## SYPHILIS—

	<i>Per cent</i>
Primary and Secondary ..	0·3
Tertiary .. ..	3

	G.—	G.H.
	<i>Per cent</i>	<i>Per cent</i>
GONORRHŒA—		
Adult Males .. ..	9	59
Moran .. ..	9	30
Adult Females ..	2·5	20

NOTE.—G.— indicates Active Gonorrhœa.

G.H. indicates History of Gonorrhœa in the past.

## HELMINTHIASIS—MASAI PROVINCE.

Except at schools it was found impossible to carry out routine examination of specimens of faeces. In all 341 specimens were examined, 65 per cent of which were positive, ascaris being present in 39 per cent, and taenia saginata in 29 per cent. Having in view the unreliability of microscopic examination of the faeces as a method of excluding infection with tape worm, 29 per cent of positive findings after a single examination suggests that the actual incidence of this parasite must be very high indeed.

Ankylostome infection was found in only 2 per cent of the specimens examined, but each case so infected was in some way connected with the coast.

## THE HEALTH OF A COASTAL TRIBE.

## THE WADIGO.

In the Annual Medical Report of the Colony and Protectorate for 1932 there was provided some account of the health of the Wadigo, a Coastal people living in the district of Digo, which lies between Mombasa and the Tanganyika boundary. That account was based partly on certain vital statistics which as the result of the institution of a system of birth and death registration, and the taking of a local census, had become available for a six months' period towards the end of the year, and partly on the results of the clinical examination of large random samples of the population in 1932, and previous years. During 1933 the registration of births and deaths was continued, but the clinical examination of random samples of the population could not be carried out to the same extent as in former years. On the other hand in respect of 1933 we have vital statistics for a longer period than six months, and we can compare them with the detailed vital statistics for a six months' period in 1932.



VITAL STATISTICS OF THE DIGO DISTRICT FOR 1933.

(Extracted from the Report of the Medical Officer of Health.)

The analysis of the Vital Records of Digo given in the 1932 Report were made on the six months' period May to October. In the present Report the period to be considered is one of twelve months, namely, from 1st October 1932 to 30th September 1933.

ESTIMATED NUMBER OF POPULATION—

Total Population at 1st October, 1932	..	..	25,744
Total Population at 30th September, 1933	..	..	26,819
Increase	..	..	1,075
Rate of Increase..	..	..	4.17 per cent

BIRTHS—

Births Registered	..	..	..	1,625
The Sex Distribution was as under :				
Males	..	..	..	50.7 per cent
Females	..	..	..	40.3 per cent
Birth Rate	..	..	..	61.8 per 1,000
There were 22 births of twins.				

DEATHS—

Deaths Registered	..	..	..	550
Death Rate	..	..	..	20.9 per 1,000

EQUIVALENT ANNUAL RATES FOR 1932 (Calculated on six months)—

Birth Rate	..	49.36	Death Rate	..	20.19
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ANNUAL RATE FOR TWELVE MONTHS (1st October, 1932 to 30th September, 1933)

Birth Rate	..	61.8	Death Rate	..	20.9
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While the death rates for the two periods are practically the same, there is a difference of about 12 per 1,000 in the birth rates. This may, or may not, represent a definite increase in the birth rate because the annual rate given for 1932 was an equivalent one based on the records of a six months' period, but when the equivalent annual birth rate based on the quarterly records of 1933 are taken into consideration it would appear that there is an increase during the year.

The following quarterly equivalent annual birth and death rates are given in order to show the seasonal variation—

QUARTERLY PERIODS	Equivalent Annual Birth Rate	Equivalent Annual Death Rate
1-10-32—31-12-32 .. ..	57.2	17
1-1-33—31-3-33 .. ..	58.48	20.66
1-4-33—30-6-33 .. ..	63.93	21.16
1-7-33—30-9-33 .. ..	68.6	25.14

It would appear that more babies were born during the third quarter of 1933 and that more people died during that period. While no explanation can be offered for the higher birth rate during the third quarter of 1933, the death rate for that period can be said to be influenced by the fact that July, August and September are the colder months of the year at the Coast, and the months when malaria and respiratory diseases are more rife.

### INFANT MORTALITY.

The total number of deaths of infants up to one year was 174.

#### SEX DISTRIBUTION

	Males	Percentage	Females	Percentage
Infant Deaths ..	92	<i>Per cent</i> 52.87	82	<i>Per cent</i> 47.13

It will be noted that although practically equal numbers of males and females are born, higher mortality amongst males is already evident by the end of the first year of life.

#### INFANTILE MORTALITY RATE

Total Number Births, October, 1932—September, 1933.. 1,625

Total Number Infant Deaths under 1 year.. .. 174

Infant Mortality per 1,000 Live Births .. .. 107

The equivalent annual infantile mortality rate for 1932 was 148.5.

It would not be correct to say that there is a definite decrease for 1933 for the following reasons :—

1. The 1932 rate was based on a six months' period.

2. The ages of the large majority of the infants who died in 1932 had to be estimated because most had been born before registration commenced. Classifying infants as under one year, when no records were available, depended on their not having reached the walking age. It is conceivable that a certain number of the children yet unable to walk were over one year of age.

3. On the other hand for 1933 the majority of the infants that died had already been registered at birth, so their actual ages were known.

The infant mortality rate of 107, although high when compared to the rate pertaining in England, would appear to be low for an African rural population according to popular belief. It is noted, however, that the Buganda Province of Uganda had an infantile mortality rate of 99.6 for the year 1932.

### MATERNAL MORTALITY.

The maternal mortality rate is calculated from the records taken during the first three quarters of 1933 because at the beginning of that year special recording of still births was instituted. The figures for still births for the last quarter of 1932 are not considered reliable.

#### MATERNAL MORTALITY—RATE PER 1,000 BIRTHS AND STILL-BIRTHS

Cases Maternal Mortality, 1-1-33—30-9-33 .. .. 10

Number of Births and Still-births, 1-1-33—30-9-33 .. 1,283

Maternal Mortality Rate .. .. 7.79

It is noted that the 1932 figure for Buganda is 9.23

#### PERCENTAGE OF STILL-BIRTHS TO BIRTHS AND STILL-BIRTHS

Number of Births and Still-births, 1-1-33—30-9-33 .. 1,283

Number of Still-births, 1-1-33—30-9-33 .. .. 28

Percentage of Still-births to Births and Still-births .. 2.17 per cent

This is low compared to the Buganda percentage of 5.37

### MISCARRIAGES.

Nine miscarriages have been recorded during the period 1-1-33 to 30-9-33, but this may by no means give an idea of the number of miscarriages that may have occurred. It is believed, however, that miscarriages are not very common.

Records are being kept for interest and they may possibly give an indication of the prevalence of venereal disease in the different areas.



The following table shows the numbers of still births and miscarriages by registration areas of the District for the first three quarters of 1933.

1933	AREAS						Total
	I	II	III	IV	V	VI	
1st QUARTER—							
Still-births .. ..	6	2	—	2	6	—	16
Miscarriages .. ..	2	—	—	—	—	—	16
2nd QUARTER—							
Still-births .. ..	1	—	—	—	—	—	1
Miscarriages .. ..	2	—	—	—	2	—	4
3rd QUARTER—							
Still-births .. ..	3	2	—	—	6	—	11
Miscarriages .. ..	2	1	—	—	—	—	3
TOTAL—							
Still-births .. ..	10	4	—	2	12	—	28
Miscarriages .. ..	6	1	—	—	2	—	9

It would appear that still births and miscarriages are both more common in areas I and V.

Area I adjoins the Mombasa district so there may be a venereal influence affecting the incidence. In area V there is a fair proportion of decadent Wa Sherazian and half-Arab people amongst whom there is a certain amount of venereal disease, possibly because Sherazi, Bado, Majoreni, and Aleno are on creeks at which dhows can call.

Area VI, which contains Vanga Township, would be expected to furnish a large number, but the birth rate of the township is very low indeed, possibly because a large number of women are sterile through venereal disease.

TOTAL DEATHS. AGE GROUP, AND SEX DISTRIBUTION.

The following table shows the comparative number of deaths in the various age groups, the sex distribution, and the mortality rates :—

	Number of Deaths		Percentage of Deaths Male to Female	*Total Deaths	Percentage of Total Deaths	†Approximate Mortality Rate per 1,000
	Male	Female				
1. Under 1 year ..	72 } 94	65 } 86	52·2	180	31·7	107
2.	22 }	21 }				
3. Over 1-5 years ..	32	27	54	59	10·4	18·18
4. Over 5-9 years ..	24	22	52	46	8	14·43
5. Over 9-13 years ..	17	9	65	26	4·6	8·28
6. Over 13-17 years ..	10	5	67	15	2·65	4·84
7. Young Adults ..	55	53	51	108	19	14·8
8. Middle Aged ..	42	33	56	75	13	20·8
9. Old Aged .. ..	28	29	49	57	10	33·58
Total Population ..	302	264	53·35	566	—	20·9

\*The total deaths given here exceeds the number used in estimating the annual death rate because the number includes deaths from other locations in which a census has just recently been taken ; these are the totals of all the deaths recorded during the period under review.

†The mortality rate for the various age groups are given approximately because they are based on calculated totals of natives in each of the age groups. Owing to natives not knowing the ages the number of natives in the various age groups of the 1932 census was probably not very accurate, although the total number of all age groups may have been fairly accurate. The totals in the various age groups used for the purpose of obtaining the approximate mortality rate of each group were calculated from the total population figures dividing out according to the number of years in each group and deducting the number of annual deaths known to occur in each group. The resulting figures must be taken only as an approximation to work on to give a comparison of the mortality rate of the different age groups.

Reverting to the table which has just been discussed, it is interesting to note that in all groups, with the exception of Group 9, there is a higher mortality amongst males. Groups 5 and 6 particularly show this with percentages of 65 and 67, respectively, of male deaths and female deaths.



It is also interesting to note that nearly one-third of all the deaths occur during the first year of life.

Looking at the mortality rate of the various age groups it is seen that the rates gradually decrease to the low figure of 4.8 at Group 6 as would be expected. When the young adult age is reached risks of life from accident, and for women from childbirth, take their toll. Middle age, as would be expected, has a higher mortality rate, and old age next to infancy has, as is natural, a very high mortality rate.

THE VARIOUS DISEASES CAUSING DEATH.

The accuracy of the probable causes of death is not vouched for because diagnosis in most cases has to be arrived at from the interrogation of parents, or relatives by the sanitary teachers as to the signs, symptoms, and duration of the fatal illnesses. However, certain diseases such as pneumonia, pulmonary tuberculosis, and others, are quite definitely recognized and have their special native names.

DISEASES, THE PROBABLE CAUSES OF DEATHS, SHOWING SEX DISTRIBUTION AND MORTALITY RATE

	Male	Female	Total	Percentage Total Deaths	Approximate Mortality Rate per 1,000 People
				<i>Per cent</i>	
Diseases of the Respiratory System	117	123	240	42.4	8.9
Diseases of the Digestive System (including Dysentery) .. ..	60	36	96	17	3.5
Malaria .. .. .	33	30	63	11	2.3
Sepsis and Toxæmia .. ..	23	16	39	6.9	1.4
Ankylostomiasis and Anæmia ..	20	14	34	6	1.3
Accident and Violence- .. ..	12	5	17	3	0.6
Puerperal State .. .. .	—	15	15	2.6*	0.5
Senility .. .. .	6	4	10	1.8	0.4
Genito Urinary System .. ..	5	5	10	1.8	0.4
Circulatory System .. .. .	4	4	8	1.4	0.3
Nrevous System .. .. .	3	5	8	1.4	0.3
Scurvy.. .. .	2	1	3	2.3	0.48
Injury at Birth .. .. .	3	—	3		
Prematurity at Birth .. ..	1	1	2		
Neoplasm .. .. .	2	—	2		
Monstrosity at Birth .. ..	1	1	2	2.3	0.48
Leprosy .. .. .	1	—	1		
Other Cases, Ill Defined .. ..	9	4	13	2.3	0.48
	302	264	566	—	20.9

RESPIRATORY DISEASES.

*Pncumonia.*

From a more detailed analysis of the deaths from diseases of the respiratory system it was found that the mortality from pneumonia was heaviest amongst infants of from one to six months, the rate being 32.7 per cent. among young adults the rate is 1.6 per cent, among middle aged people 7 per cent, and in old age 10.6 per cent.

Furthermore, pneumonia appears to be the cause of 27 per cent of the total deaths occurring among the whole population. In other words, pneumonia is responsible for six of the twenty-one deaths which occurred among each 1,000 of the population, and it would appear that in this tropical coastal district of East Africa no less than in more temperate countries pneumonia is the "Captain of the men of Death".

*Whooping Cough.*

In the year under consideration 1.4 per cent of all deaths were due to whooping cough.

*Tuberculosis.*

The mortality rate for tuberculosis was about 1 per 1,000 of the population.

DISEASES OF THE DIGESTIVE SYSTEM.  
*Age distribution.*

	Mortality rate per 1,000				
Infants	...	...	...	...	20
Children	...	...	...	...	1.5
Adults	...	...	...	...	1.17
Total population	...	...	...	...	2.5

Seasonal variation of incidence appears only amongst infants.

MALARIA.  
*Age Distribution of Deaths.*

Infants (0-12 months)	...	11.8 per 1,000 births
Group 3	...	4.0 per 1,000 in the group
„ 4	...	2.5 „
„ 5	...	0.95 „
„ 6	...	0.64 „
„ 7	...	0.94 „
„ 8	...	1.38 „
„ 9	...	3.5 „
Total population	2.3	

OTHER CAUSES OF DEATH.

The figures for causes of death, other than those already mentioned, are too small to allow of profitable analysis.

INVALIDITY.

Important as mortality rates may be as indicating the health of a population—the death rate in Digo is approximately twice that for England and Wales—an even more important index of health is the invalidity rate, if it can be determined. In the case of the population of a school, or a prison, a regiment, or a service, this can often be done with but little difficulty, and fair accuracy, the amount of sick time being a fair measure. In the case of a primitive rural population the difficulties are greater for “sick time” cannot be estimated. There are, however, other means of estimating the degree of health, or ill health, which may pertain among a population, and one is by determining the degree of anaemia pertaining among the people.

*Anaemia among the Wadigo.*

The chief causes of anaemia among the Wadigo are probably ankylostomiasis, malaria, ascariasis, schistosomiasis, and an ill-balanced dietary. The first four diseases are well known causes of anaemia, but in Digo, according to our clinical experience, the degree of anaemia among individuals is not always in proportion to the severity of the infestation of the individuals by the parasites associated with these diseases. In the view of the Medical Officer of Health an ill-balanced dietary plays a large part not only as a direct cause of anaemia, but by reducing resistance to those parasites which cause disease of which anaemia is usually a symptom.

As has been indicated in this, and previous Reports, haemoglobin estimations have been made from year to year on groups of unselected natives. During 1933 haemoglobin estimations were recorded in such a fashion that the average percentages could be calculated for each of the nine age groups used in the census. These averages have been plotted on a graph and show the curves for males and females. On the same graph the curves for male and female Masai, based on estimations made during the Medical Survey of the Masai Province in 1930-1931, have been plotted for comparison.

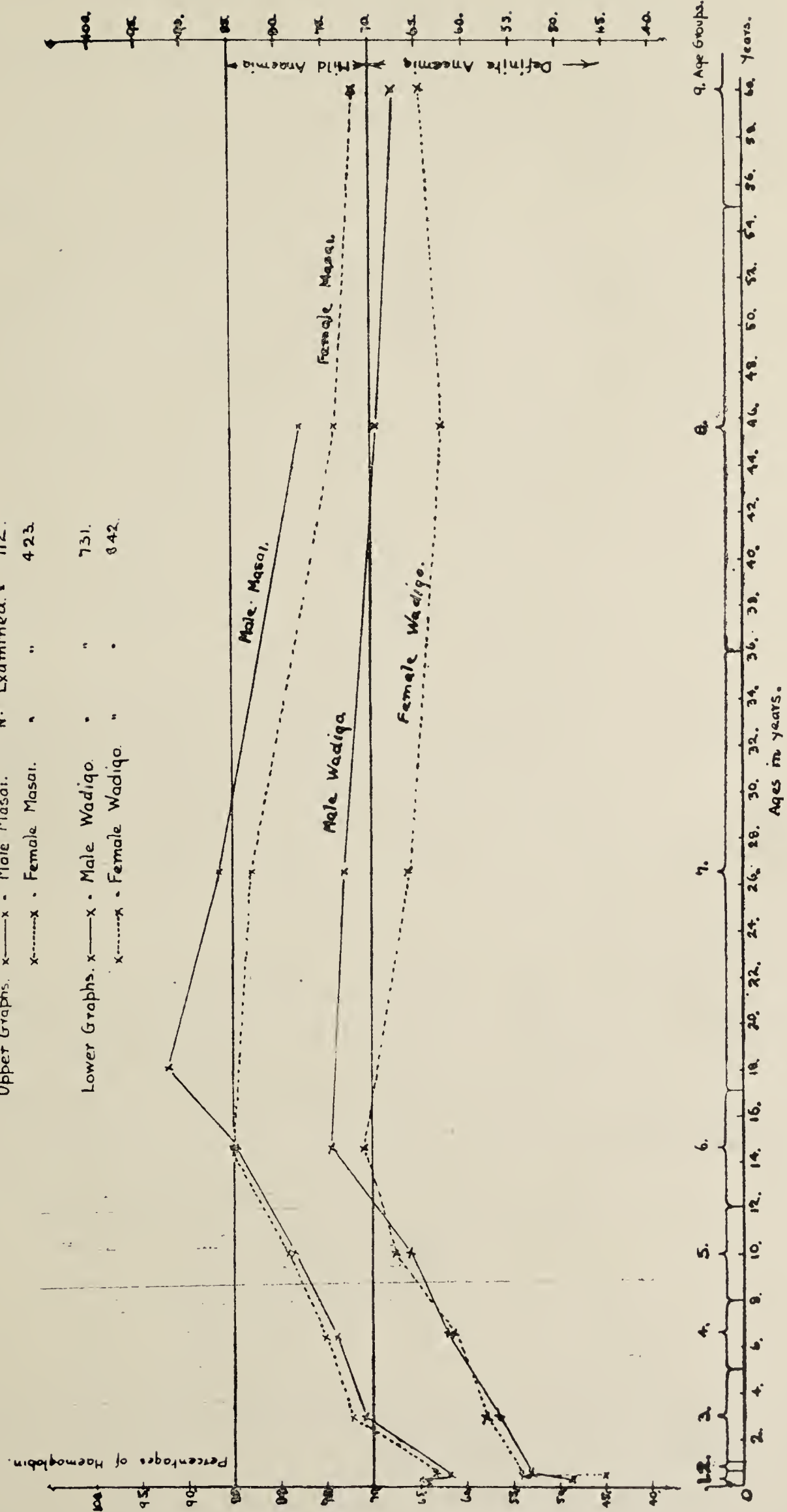
# Haemoglobin Estimations among the Masai and Wadiqo by Age Groups.

Upper Graphs. x—x - Male Masai. N<sup>o</sup> Examined. 712.

x-----x - Female Masai. " 423.

Lower Graphs. x—x - Male Wadiqo. " 731.

x-----x - Female Wadiqo. " 842.





It is at once apparent from the graph that the great bulk of the Wadigo are anaemic, basing anaemia on home standards. The peak of the graph barely touches the 75 per cent mark.

It would appear that Wadigo children are born very anaemic from an already anaemic mother impoverished in her iron supply. How then can the baby get sufficient iron for the store necessary to tide it over the breast-feeding period, for milk is very poor in iron? It would appear that were it not that Wadigo children are wrongly fed from birth their climb towards a higher percentage of haemoglobin would probably be delayed. In the wrong feeding (i.e. food supplementing milk during the first six months) these infants may be getting a little more iron than they can derive from milk; at any rate they arrive at one year with about a 3 per cent increase of haemoglobin. Male and female children advance steadily up the haemoglobin scale until puberty is reached, but here the paths diverge, the male to reach the apex of 75 per cent, the female to pass down the scale to 63 per cent and middle age, after which she may climb again, and approach the path of the male in its gentle dip down to old age and 68 per cent haemoglobin.

It is probable that the extra blood loss due to menstruation, and child bearing, makes increased demands for iron which cannot be replaced, and so there is more anaemia amongst females from puberty to the menopause.

Investigations as to the common dietary of these people reveal the fact that there is a grave deficiency in the iron intake. Muhogo (Cassava), or rice and fish, with very occasionally meat, and vegetables only when fish are scarce, and that may be only once a month, is a diet that is certainly badly balanced and lacking in a sufficiency of iron.

It was thought perhaps that there might be a deficiency of iron in the coast greens, but the results of the analysis of twelve varieties sent to the Laboratory for investigation by the Biochemist showed iron, calcium, and phosphorus to be present in all the specimens, some of which were very rich in the haemoglobin-forming element. It is estimated that a daily ration of about 4 ounces of the richest specimens of green would yield the standard daily requirement of 15 grams of iron. With other foods containing iron in the dietary that amount would not be required, but it would be a safe amount to take to ensure a sufficiency. Propaganda on the Coast now is: "Eat more greens".

During the period 1-1-33—30-9-33 haemoglobin estimations were made on some 2,195 unselected natives from whom blood slides were taken for parasite rate estimations. The large majority of these estimations of haemoglobin were analysed, and age grouped for the graph submitted.

In order that this year may be compared with last the average percentages have also been analysed according to the old grouping of adult males, adult females, children, and babies.

AVERAGE PERCENTAGES OF HÆMOGLOBIN, 1932 AND 1933

YEAR	Adult Males	Adult Females	Children	Babies
	<i>Per cent</i>	<i>Per cent</i>	<i>Per cent</i>	<i>Per cent</i>
1932.. ..	76	72	64	43
1933.. ..	73 +	68	62	51

There appears to be a definite falling off in all groups save babies.

What is the cause of this decline?

The falling off is greater in the adult female group than in the others.

Malaria has not been more rife. Is the incidence of hookworm increasing? The possibility that more of the less robust people were in the villages at the time the bloods were taken must be borne in mind. Can the drought have anything to do with it? Food, and particularly greens, have been difficult to get in abundance.

DISCUSSION OF THE MASAI AND DIGO FINDINGS IN RELATION TO THE STATE  
OF THE PUBLIC HEALTH OF THE COLONY AS A WHOLE.

We now have before us a large number of data with regard to health and mortality among two large samples of the African population of Kenya, and we have to consider what these data mean. The first sample consisted of a pastoral tribe, the Ma-ai, numbering some 50,000 and inhabiting highland country, possessing great flocks, and comparatively untroubled by malaria or hookworm. The second sample consisted of an agricultural tribe of some 26,000 souls, inhabiting a hot moist lowland country where malaria and hookworm are rife.

If we have regard first to the question of anaemia it will be seen from the graph on page      that the Masai would appear to be by far the fitter people of the two, at least if the percentage of haemoglobin has any direct relation to general health. But the haemoglobin curve for the Masai shows more than that these people are more "full-blooded" than the Wadigo. It shows also that by European standards the Masai on the average are far from full-blooded. On the other hand, the Wadigo for all their anaemia appear to be increasing in numbers, their birth rate exceeds their death rate, and their infantile mortality rate is by African standards probably low. But what is to be the fate of these children? Our figures suggest that they may suffer less from yaws and hookworm than their parents did but malaria remains, and will remain for many years, and our figures also suggest that on account of a poor dietary they are in no fit condition to resist disease, that they are so poorly fed in fact that a diminution in one cause of anaemia, namely, hookworm, may readily be counterbalanced by an increase in another, namely, a drought affecting their green food supplies, and droughts are recurrent. When all is said we are still left with a death rate of 20 per thousand, an infantile mortality rate of 107, both figures much greater than those which prevail in England, over 30 per cent of the children only fairly nourished, and a percentage incidence of pyorrhoea of 83 per cent in adults.

Clearly very radical changes of culture and environment will be required before the population of this district becomes even a moderately healthy people.

The population of the Digo district is fairly representative of the population of the coast as a whole, that is, of some quarter of a million people.

Turning now to the more full-blooded Masai in their cooler upland country; what do we find? We find but little malaria, and but a small degree of infection with hookworm it is true, but on the other hand we find a high incidence of tapeworm and of roundworm, somewhat similar figures for nourishment, a very high incidence of pyorrhoea, an incidence of eye affections suggestive of Egypt, and a "child" mortality rate bordering on 500 per 1,000 births, while about 34 per cent of the women appear to be sterile: the cause of the sterility, gonorrhoea.

Here in Masailand then we have four chief causes of morbidity:—

- Tapeworm and roundworm.
- Dietary deficiency.
- Conjunctivitis.
- Gonorrhoea.

None of these conditions are peculiar to the tropics, but the severity of all is great, and in Masailand rheumatism and gonorrhoea go by the same name, a large percentage of the women are sterile, almost certainly the folk are not increasing in numbers and it would appear that if conditions cannot be altered they must slowly disappear. The conditions which favour these results are not difficult to find. A high rate of roundworm infestation is a sure index of insanitary circumstance. Tapeworm is to be expected among a meat-eating people if cooking and sanitation are not understood. Conjunctivitis is also to be expected where water is as rare as manure is plentiful, and the uses of manure not understood.



Gonorrhoea? From time immemorial promiscuous intercourse between the warriors and the young unmarried women of the Masai has been customary, while the elders have always been hospitable, but formerly the maintenance of fitness for war imposed limitations upon youth, and venereal infection was at least rare, if not perhaps unknown. Later, with the breaking down of geographical barriers, the infection may have been introduced, certainly with peace old disciplines disappeared, and to-day gonorrhoea is almost universal among the Masai, and the very existence of the folk in jeopardy, at least as a people.

A high percentage of pyorrhoea is not surprising if we remember that blood and milk and meat, eked out to-day perhaps by some maize meal, are still the customary and the only rations. Chronic dyspepsia as revealed by epigastric pain among over a quarter of the people is only a lesser evil, but hardly a sign of health. Green food and fruit are unknown in Masailand, and the women starve themselves in the last months of pregnancy in the hope of an easier delivery. Can we call the Masai a fit folk? Our figures are all against it. But they were once a great people as African peoples go. The question at once arises were they once healthier? One cannot but think that they must have been, for gonorrhoea is probably a fairly new disease among them, or at least it cannot long have been so universal, and once, undoubtedly, they had a greater interest in life. But had they less blindness then, or fewer worms, were their children cleaner or better nourished? To-day domestic life among the Masai, as among every tribe in Africa, is, if we only care to use our eyes, to disregard for a moment oil and paint and fine feathers and falsely glistening skins, to look into cooking pots, to examine finger nails and beds, the eyes and noses and the fingers of the children, and the skins of the middle aged, almost incredibly filthy, and filth in this degree is not compatible with health. But the Masai were never cleaner than they are to-day, and to-day if they are not lousy it is only that woven garments have not yet replaced oiled sheepskins and painted bodies.

A second question arises—and it is one which leads us to a comparison which may help us from our knowledge of our forty thousand pastoral Masai to form some estimate of the public health of at least a million of their agricultural neighbours. Need the Masai have been much healthier than they are to-day to have established their tradition?

Writing in 1931 on "The Physique and Health of Two African Tribes", namely, the Masai and the Akikuyu, Gilks and Orr in a report to the Committee of Civil Research summarised a survey of these tribes, which had been made in 1926-27, as follows:—

"A survey of two tribes, the Masai and Akikuyu, showed that the diet of the former consisted to a large extent of milk, meat and raw blood, and that of the latter mainly of cereals, roots and fruits, the bulk of the diet being cereals. The outstanding points of difference in chemical composition of the two diets were that the Masai have a relatively very high intake of protein, fat and calcium, while the Kikuyu have a high intake of carbohydrate and a low one of calcium. Differences were found in the dietary customs between men and women in both tribes, the diet of the females approaching in each case to the mean between the diet of the males.

Physical measurements showed that the full-grown Masai male is on an average five inches taller and 23 lb. heavier than the full-grown male Kikuyu, and his muscular strength, as determined by the dynamometer, is 50 per cent greater. Marked differences were found in the incidence of disease in the two tribes, bony deformities, dental caries and anaemia, pulmonary conditions and tropical ulcer being much more prevalent amongst the Akikuyu. On the other hand, intestinal stasis and rheumatoid arthritis were more common amongst the Masai.

The striking difference in physique between the Masai and Akikuyu raises the question to what extent diet can affect stature and physique of a race. In Scottish experiments with school children it was found

that the feeding of milk was followed by increased rate of growth in two successive years with the same children, but there was nothing to show whether this increase represented merely acceleration of growth with a shortening of the growth period, or whether, if the milk had been continued, there would have been a difference in adult stature. The results of the measurements of the Kikuyu and Masai at first sight suggest the latter alternative. But, although there has been a good deal of intermarriage between the two tribes, they were originally of different stock, and we have no information as to whether, or to what extent the differences in stature and physique may be inherited characters. It would be an interesting study to correlate diet and stature in different countries, to ascertain whether any correlation exists between the quality of the diet and mean adult stature.

With regard to the bearing of the results of the investigation on conditions in Kenya, we are probably justified in concluding that the diet commonly in use amongst the Akikuyu and other tribes of similar customs is badly balanced, being too rich in carbohydrate and deficient also in calcium. It is probably deficient also in other substances required as constructive material for growth, and in certain of the vitamins. On the other hand, the Masai, with a diet at the opposite extreme, possibly have too little vegetable food rich in carbohydrate and cellulose. Improvement might be brought about by increasing the use of green vegetables by both tribes, and of milk by the Akikuyu."

Clearly in the view of these reporters the odds are on the Masai still to-day; and if impressions are of any value the Akikuyu of to-day are not a less fit people than their ancestors, and their diet, though still relatively poor, has in recent years improved out of all knowledge. But the later and more detailed survey of the Masai which we have been considering ends as follows:—

"It will be seen from the discussions on the various diseases and morbid conditions afflicting the Masai, that their greatest menace is gonorrhoea, because it is not only the cause of much ill-health and suffering, but is striking at their very existence as a tribe.

Next of importance would appear to be eye diseases, the discomfort, and often acute suffering of which, must be dreadful to bear. A certain amount of blindness of swift onset and a greater amount of gradual loss of sight in middle age through entropion, leaves many helpless creatures to be a burden to themselves and their relatives.

Helminthic infestations of tapeworm and ascaris which are very common are possibly sapping the vitality of their hosts to a greater extent than is realized.

Child mortality, at the rate of 447 per 1,000 although perhaps no greater than that of other African tribes is terrible to contemplate. Their bad start, while yet in utero, must be a terrible handicap when at birth they have to contend with gastric disorders from highly unsuitable food, disease imbibed from fly polluted milk, and lack of sufficient sunlight. Lack of cleanliness brings in its train scabies sores and staphylococcal infections to the skin. Thus attacked, internally and externally, the wonder is that any of them survive, and though many reach maturity bearing the scars of the struggle, there are to be found amongst the young women and Moran, really splendid specimens of humanity.

A race that, in spite of such a struggle for existence, can produce such a type as the healthy, finely built, athletic Moran, with the courage to attack single-handed and shieldless, the fiercest of lions, is worth doing something for.

All too quickly the span of robust manhood comes to an end. Moran marry and enter the ranks of the 'wazee' (old men) and very soon the complaints of old age are on many of them before they have even reached middle age. As their teeth become long and wobble in beds of pus,



their joints and muscles stiffen to the irritation of absorbed toxins from mouth and bowel. Inactivity from choice or enforced through pain, aggravates constipation and intestinal toxæmia. And so, crippled, half-bent, and often sightless, they totter slowly out of life if they are not swiftly carried off by the onset of some acute infection for which they have lost their powers of resistance."

If such be the health of the Masai, what of their less well built, or less well developed neighbours, the Akikuyu, who number near a million, or about a third of our total population? Unfortunately, though we know much of the Kikuyu, we have no figures for the general population, or for random samples of the people, and our certain knowledge may be summarized as follows :—

- (a) that like the Wadigo they are undoubtedly increasing in numbers (unpublished reports);
- (b) that in certain physical attributes the Masai excel them (Gilks and Orr);
- (c) that their diet is defective (Gilks and Orr);
- (d) that their culture is still low, and their sanitary environment deplorable to a degree (various reports), and
- (e) that they suffer from a welter of diseases (all District Medical Officers' Reports).

Possibly, and not improbably, the Akikuyu taken as a whole are fitter and healthier than the Wadigo, possibly, though the field workers whom Gilks and Orr reported would seem on the whole to have been of an opposite opinion they may even be fitter than the Masai, but that there is much to it on either side none who has seen much of both of these peoples would care to argue. If that be so, and if the health of the Wadigo and the Masai be as our figures show we can arrive at but one conclusion, namely, that the state of the public health of the native inhabitants of the coast and highlands of this part of Africa is poor indeed.

But the question of the prevention of this ill-health remains for consideration, and though the picture that our figures suggest is, if they are fairly read, one of distress, chronic disease, on occasion acute famine, and in the evening of life only too often misery, that there might be another side to the picture our data equally clearly show.

One great cause of Africa's ill health is clearly a poor dietary, another lack of culture on a wider front—with regard to the care of children as well as with regard to the care of fields, and a third—it emerges clearly in the case of the Masai—is a lack of knowledge of how to adapt old customs to the changing times.

Gilks and Orr concluded their report with the following words :—

"The problem (of nourishment) is not confined to Kenya. It appears to exist in many different areas in our tropical dependencies. It may be judged from the introductory statements in the early part of this report that the loss of health and efficiency attributable to deficient diet is, therefore, of considerable economic importance.

#### *Conclusions.*

1. In view of the great practical importance of the subject studied and the extreme difficulty of the associated problems, some of which are, indeed, of a fundamental nature, it is impossible to regard these investigations as more than a series of preliminary observations. They lie, however, in a field of research, which, in our opinion, urgently calls for both intensive study and extensive exploration.

2. These investigations, which were promoted by the Empire Marketing Board, have no immediate bearing on the increased production or better marketing of any particular product. But information obtained in investigations of this kind is calculated to hasten the improvement of

the physical condition of the native and to increase his importance as an economic factor. From this material point of view alone the continuation of research on the nutritional conditions of natives is justified. The Empire Marketing Board has shown foresight in promoting such long-range research, which tends to the development of those overseas parts of the Empire with a large native population."

And with regard to the Masai, the last note of the Medical Survey of three years later is as follows :—

*"Prospects of Change.*

For long at a standstill, it is believed that the Masai, particularly in the Kajiado District, are now ready to go ahead. Elders of the Local Native Council, in meeting, have themselves expressed desire for advancement. In a call for more varied education over a longer period for the boys at school, such education to include training in agriculture and handicraft, they evinced a marked change in their outlook on the future. Their raising of a ban on veterinary work in the reserve also showed that times had changed.

People of such intelligence as the Masai, when they begin thinking along these lines, are bound to progress rapidly, especially when they work in co-operation with the officers concerned and under the co-ordination of the head of the District in the pursuance of a definite policy."

### (I) GENERAL DISEASES.

In Tables V and VI which are printed at the end of this Report a detailed list is provided of the number of cases of the diseases mentioned therein which have been treated either as indoor patients in hospital or as outdoor patients at hospital dispensaries. In the first of these tables the numbers of deaths which occurred among the hospital cases are also shown. In these tables the various diseases are grouped under sixteen headings in accordance with the "Model Medical and Sanitary Report" issued by the Colonial Office, and in the diagrams included in this chapter a percentage analysis of the contents of the two tables is provided, based on the grouping used in the tables.

With regard to the figures given in the tables and analysed in the diagrams, it should be noted, however, that the figures reflect only the incidence of the various diseases among those persons who come into hospital or who attend at a dispensary, and that they do not of necessity reflect, and in many instances do not reflect, the relative incidence of the various diseases among the general population. For example, if we have regard to the second diagram it will be seen that among out and in-patients admitted to hospital or attending at dispensaries for the treatment of "epidemic", "endemic" or "infectious" diseases 35 per cent were suffering from malaria and 23 per cent from yaws, but these percentages, however accurate they may be with regard to hospital and dispensary patients, do not reflect the relative incidence of these diseases among the general population. What the percentage difference between the incidence of these two diseases among the general population may be we do not know, but very certainly it is much more than 12 per cent.

In the case of deaths from "epidemic", "endemic", or "infectious" disease as shown in the lower part of the second diagram, the discrepancy between the hospital figures and those for the general population must be even greater. According to the diagram tuberculosis is responsible for 33 per cent of the hospital deaths from infectious disease, and malaria for 21 per cent, but among the general population of the Colony tuberculosis, though not in all districts, if even in any, an uncommon disease, is certainly an uncommon disease compared with malaria, and though tuberculosis when it occurs is often fatal, and malaria more often a cause of disability than of death, the latter disease is nevertheless a most serious cause of mortality among children, and it would be surprising indeed if on the whole it were not still responsible for many more deaths than tuberculosis.



Lastly it may be noted that as etiology is not the basis of the tables, to take one example, the group entitled "diseases of the digestive system" includes diseases of such different origins as hernia and ankylostomiasis, conclusions should not be drawn from the diagram without careful reference to the details of the tables to which they are related.

In the "Model Report" referred to above it is required that the question of public health should be discussed under the headings "General Diseases", and "Communicable Diseases", the latter being defined as "Mosquito or Insect borne", "Infectious Diseases", and "Helminthic Diseases". In Table V of the "Model" the group "General Diseases" is, however, only one of sixteen groups and though it comprises twenty-seven diseases these diseases, as will be noted from the diagram, are responsible for not more than 4 per cent of the admissions to hospital. If, on the other hand, for the purposes of this section there were to be included, for the purposes of discussion, under the heading "General Diseases" all those diseases other than those which may come within the group of communicable diseases as defined above, it might be necessary to deal with about one hundred and sixty-three diseases. To attempt to do so in any detail would be to ensure almost inevitably that the wood would be lost sight of among the trees, while to deal with the groups as at present constituted would not be easy.

To avoid these difficulties it has been usual in preparing these reports in the past to confine attention to the consideration of a few "general", or non-communicable, diseases of particular, or unusual interest, such as, for example, malignant disease, nephritis, or specific examples of food deficiency. But by this method the intention of the "Model" cannot be readily fulfilled for a few lines however boldly and accurately drawn will not if unrelated convey a picture, and the object of the Model is to present information in "a useful shape". The point would appear to be that in considering the public health in relation to "General Diseases" it is not so much with individual diseases that we are concerned as with the results of disease in general, and if one thinks for the moment of the average dispensary patient it becomes clear at once that this must be so, for though in dispensary practice one may enter up each patient in the out-patient register as suffering either from ulcer, or scabies, or rheumatism, or whatever may be his immediate and most obvious complaint, it is seldom indeed that such entries are in any way completely descriptive of the condition of any individual patient. Text book pictures are rare in the dispensary. Let us take a far from unusual example.

A somewhat dilapidated African appears at the dispensary complaining of an ulcer of the leg of long duration. Quite clearly he has an ulcer. But is that all that is the matter with him? If we examine him even superficially we will probably find, firstly that he is ill-nourished, secondly that he is anaemic, thirdly that he has pyorrhoea, fourthly that he has an enlarged spleen, and fifthly that he has "the itch". A more careful examination would probably show that he was infected with malaria, and infested with intestinal worms. Still further investigation might reveal that his Wassermann reaction is positive, and that he is still suffering either from yaws or from syphilis. If he were to die, and if a post mortem were to be performed we would probably find that he had a fine cirrhosis of the liver, and not improbably some changes in the vascular system of the covering of his brain. Is it a wonder that he has a chronic ulcer of the leg? Is the ulcer either the cause, or the whole, of his "disease"? Is it on account of his ulcer that he is dull, stupid, and lackadaisical, as a social, or economic, unit all but useless, and in his present condition almost entirely uneducable even though he is not yet an old man? In such a case is "ulcer" an adequate diagnosis? If it is not, and if any considerable proportion of our cases of ulcer, or of any other "disease", consist of patients such as I have just described no picture of the public health can be provided by discussing particular pathological conditions or diseases without relation to the fashions in which in practice they are grouped by nature in our individual patients, and without reference to their results.

But the patient whom we have described is not unusual, he is, with the exception perhaps of his ulcer, typical not only of the average dispensary patient but typical of rural Africa, for the most outstanding features of his case, if only we will look beyond his ulcer, are not the ulcer, but his poor physical condition and his mental dullness, conditions common not only among dispensary patients in Africa, but only too common and general among the people as a whole. Of the poor physical condition of many of the people, and its relation to disease among other causes, little need be said here, neither the facts nor their relation are in doubt, and the public health issue stands very clear, for, as we saw earlier in this chapter, if the African were only a better farmer he would at least be better fed, and, not improbably, better able to combat disease by purchasing the means of cleanliness and the knowledge of how to use them. It may not perhaps be fully realized even yet how low, compared with what it might be, the standard of African physique still is, and how poor the African's physical health, but none doubt that both might be vastly improved if disease were to be controlled, and an adequate dietary provided.

But the great majority of our patients are dull as well as being ill-nourished, and showing other and clearer signs of being in poor physical condition, and very clearly suffering in almost every case from one or more definite infections, or conditions, to which we can put names, and perhaps treat and cure. But the matter may go much further than that, for mental dullness, or relative mental insufficiency of one kind or another, is not confined to hospital and dispensary patients, but is, at least in the popular mind, a characteristic of all but an insignificant proportion of Africans. Whether such mental insufficiency may be as general, or as marked, as is supposed by many, is not a matter which can be considered here, for that thesis could only be substantiated, or repudiated, by an elaborate and extensive enquiry; but that both inside and outside of hospital and dispensary walls, and among non-patients as well as patients, notable mental insufficiency is far from uncommon among Africans is as far beyond doubt as is the fact that some are of relatively excellent mental capacity. If this be so it becomes a matter of fundamental importance in discussing the public health in Africa to consider how far mental health, on which after all the efficiency of the individual largely depends, is being affected by general disease, and other factors of environment.

#### MENTAL HEALTH AND CAPACITY IN RELATION TO ENVIRONMENT AND GENERAL DISEASE.

It is common experience that many Africans are, at least by European standards, dull. It is also, however, our experience, as has been recited in the chapter of this Report dealing with "Administration", that many Africans can be trained and educated to a very high degree of usefulness and efficiency. In the immediately preceding paragraph it has been suggested that to some extent African dullness and inefficiency may be the outcome of physical disease. Elsewhere in this Report it has been stated, and an attempt has been made to prove the statement, that till the African is a good farmer he will not be a healthy peasant, for not till then will he be well fed, and the relation of nutrition to disease has been stressed both in the Digo and Masai Reports.

Unfortunately, however, we are in no position yet to define precisely the effects of disease and other environmental factors on the mental health of the African, for but little work has as yet been done with regard to this subject, and we have little knowledge even of the normal. Nevertheless beginnings have been made in several directions.

During the year the Visiting Physician to the Mathari Mental Hospital, Dr. H. L. Gordon, communicated to the Royal Society of Medicine a paper\* on a research which he had carried out with regard to neurospirochaetosis in

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\*"Neurospirochaetosis in the East African" by H. L. Gordon—Proceedings of the Royal Society of Medicine—January, 1934.



East Africans in which he advanced evidence to show that, contrary to general belief, spirochaetal affection of the central nervous system occurs in Africans, and among a certain group of our African patients at least is not uncommon. Gordon's research was carried out with regard to the inmates of a mental hospital, and while it could not be determined whether the spirochaete with which his patients were affected was that of syphilis or yaws the fact remains that in the case of some of his cases at least yaws may very probably have been the original condition. Apart, therefore, from the question of the unity or duality of these conditions Gordon's research raises a large issue, namely, whether or not the nervous system may be affected in yaws. If research should show an answer in the affirmative then, if we have regard to the enormous extent to which yaws is, or has been, incident in Africa, much light may be thrown on the subject of the mental health of the natives of this Colony.

But yaws is only one disease, and there are the hundred and one toxæmias from one or more of which almost every African native suffers throughout his lifetime—the toxæmias of malaria, of intestinal worms, of pyorrhoea, and of the bowel, to mention only a few. There is also the question of diet, a hungry child is seldom mentally bright, a child that has always been both under, and badly and irregularly fed is, we now know, usually relatively dull, and in England this fact has been so clearly appreciated that free meals have followed free education, if only that the time of the schoolmaster might not be wasted.

In Africa all children from birth to adult life are wrongly fed, and from the figures which I have quoted above for the Wadigo and the Masai it is clear that well over a third are also under fed. Furthermore, in Africa the child may be at a most serious disadvantage even before it is born, for in the tribes we have discussed the pregnant mother of intention starves for three months before delivery, in the hope of a smaller child and an easier confinement. Can we expect such children to enjoy mental health in later years, to have fine brains in feeble bodies?

During 1933 another issue has been raised. In the course of the routine investigation of the inmates of the Mathari Mental Hospital, the visiting physician has found cases of mental disorder which he can only class as dementia praecox,\* or premature dementia. The significance of this observation may be very great, and especially as in every case there was a possible association with scholastic education, for as the times move scholastic education will increasingly become a factor of African environment. The questions arise who are to be educated, and how? It is of importance that, if we can, we should in the first place devise some method of selection whereby the less fit will not be subjected to undue strain, and, what is equally important from the health aspect, that we should so design our curricula and our methods that strain is reduced to a minimum throughout our schools. It has not been the experience either of England or of Germany, to take only two examples, that their present systems of education are wholly favourable to the promotion of the mental health of the child. As a step forward in England special schools have been established for the backward, while wherever it is necessary the ill-nourished are first fed that they may be more fit to receive instruction. Even so there are disasters, and every insurance practitioner knows of unfortunate results, and every thinking schoolmaster is far from happy about the system of which he forms a part. In Germany the disaster is notorious. If this be so among a fairly healthy people, what might be the result of gravely altering the environment of a seriously damaged people, of whose mental make-up we have almost no knowledge at all, by the unthinking application of an educational system which is admittedly defective?

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\*"Psychiatry in Kenya" by H. L. Gordon—*Journal of Mental Science*—Jan., 1934.

There is nothing so urgently and so universally required in Kenya as the cultural improvement of the African people of the Colony, for without such improvement they can neither be well fed, nor clean, nor rear healthy children, nor even retain their fields which ignorance is fast destroying, and they can neither have good houses, nor hospitals, nor nurses, nor midwives, nor doctors, for if they are to have nurses and doctors in sufficient numbers they must be African nurses and African doctors. That is one aspect of the sanitary issue, and a main burthen of this Report; and in our experience, so far as it has gone, there is nothing to suggest that the African of to-morrow should not be a prosperous peasant, a good farmer, or a successful doctor, or architect, or engineer. But there is the wider view of education, and an old medical tag reminding us that it is wise to treat the patient as well as his disease, and another burthen of this Report is that the African is sick, while common sense suggests that if his skin is black instead of white, his brain and his mind, and the working of his body may be different also. A black skin we know, or think we know, has some advantages in the tropics, and not improbably the brain and mind of the African may have their advantages as well. It may be, but we do not know, all that we know is that it would be foolish to imagine that they might not be different from the brains and minds of those whose skins are white, or brown, or yellow. But following on contact with western civilization, and eastern civilization and all the demands of modern industry the environment of the African is changing; we may perhaps guide the change, but if we are to do it well we must know much more of African mentality and physiology than we do to-day.

So far I have dealt chiefly with disease though in the last paragraph I have suggested that the nature of the human material we are dealing with is not without importance. During the year two pieces of research have been carried out in Kenya dealing with some of these issues. The first, which was carried out in the laboratory by one of our own officers, dealt with the structure of the African brain.\* So far as it has gone this research would seem to show that the brain of the African is different from that of the European, and that the brains of those adult Africans which were examined were, in some respects at least, less well developed than the European. The causes of these differences are still to seek. As we have seen—almost of a certainty—diet and disease are environmental factors playing great parts. Another piece of work was that of Gordon, who, approaching the question in the living, found comparable physical results, and over a large series of cases clear evidence of mental defect.† But again the causes have still to be established.

The public health issue is very clear. In the interests of health environment must be altered, and altered radically if we are to ensure a folk with healthy minds in healthy bodies. But a human population is a delicate organism reacting readily to environmental change, and primitive, or backward, or weaker peoples are not less delicate organisms than more sophisticated communities.

If mental health is a problem in the older countries it is no less so in Africa, but here we know less, and if we are to progress, and to progress without needless and heedless damage, two medical investigations are of the greatest urgency. Firstly a research on a wide front regarding African mentality, and the physical basis of the African mind; and secondly a research with regard to the processes of African physiology under African conditions. When these things have been done we may perhaps know better both how to train the African mind, and how to feed the African body, economically, and with less danger of damage than exists to-day.

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\*"The Brain of the Kenya Native"—F. W. Vint, *Journal of Anatomy*, January, 1934.

†"Amentia in the East African"—H. L. Gordon—*The Eugenics Review*, January, 1934.



**(II) COMMUNICABLE DISEASES.  
MOSQUITO OR INSECT BORNE.**

**Malaria.**

There was no notably unusual incidence of malaria during the year.

The total number of cases treated at hospitals and dispensaries (other than out-dispensaries) was 22,369 as against 18,362 in 1932 and 28,507 in 1931.

These cases were classified as follows :—

Tertian	...	...	...	1,330
Quartan	...	...	...	793
Aestive-autumnal		...	...	4,738
Undifferentiated		...	...	989
Clinical	...	...	...	13,528
Cachexia	...	...	...	690
Cerebral	...	...	...	1

The amount of quinine issued to hospitals, dispensaries and post offices during the year was 10,440,000 grains valued at about £2,323.

An experiment was carried out during the year with quinine febrifuge with a view to determining whether it might be desirable to replace other forms of quinine by that drug in the interests of economy. The results appeared to show that under hospital conditions there was little to choose between the febrifuge and other forms of quinine, but for administrative reasons and on account of the falling price of quinine it was decided not to change over to the febrifuge at the present time.

As indicated in last year's Report, the amount of quinine used in the Colony is still only a fraction of what would be required if all the cases of malaria which occur annually were to be treated.

Ten million grains of quinine are about sufficient for the treatment of 50,000 cases. If, as is not improbable, a third of our population of 3,000,000 suffer more or less from malaria every year, sixty times that amount of quinine could be used, but that amount would cost over £50,000.

**Blackwater.**

The comparative table of cases treated by the Government medical staff for the past five years is as follows :—

		<i>Cases</i>		<i>Deaths</i>
1929	...	38	...	11
1930	...	50	...	8
1931	...	41	...	10
1932	...	52	...	2
1933	...	28	...	9

**Plague.**

Only 163 cases of plague were reported as having occurred in the Colony during the year as against 281, 604 and 959 in 1932, 1931 and 1930, respectively. Of these cases the majority again occurred as in 1932 in the Keruguya area of the South Nyeri Reserve of the Kikuyu Highlands, while only 41 cases occurred in the old endemic areas of the Kavirondo Districts of the Nyanza Province.

Mombasa and Nairobi remained free of plague throughout the year.

**Trypanosomiasis.**

The total number of new cases reported during the year was 28.

**Relapsing Fever.**

The comparative table of reported cases is as follows :—

<i>Year</i>	<i>Cases</i>	<i>Year</i>	<i>Cases</i>
1930	... 62	1932	... <del>74</del> 10
1931	... 74	1933	... 171

**Typhus.**

The total number of cases reported was 5.

**INFECTIOUS DISEASES.****Pneumonia.**

The comparative table of admissions to Government hospitals for the past six years is as follows :—

	Admissions	Deaths	Death rate per hundred
1928	1,314	362	27·5
1929	2,175	398	18·3
1930	2,014	389	19·2
1931	1,628	373	22·9
1932	1,363	311	22·8
1933	1,830	421	23·0

This table, however, gives no indication of the enormous part which pneumonia plays in the death rate of the Colony as a whole. In Nairobi among the towns out of a total of 585 deaths no less than 215 were attributed to pneumonia and broncho pneumonia, while in the reserves it is the experience of all officers that "respiratory diseases" takes a heavy toll both of adults and infants.

**Smallpox.**

Three cases occurred. Two of these occurred in Mombasa early in the year and of these one was imported. The third case occurred near Voi on the Railway about one hundred miles inland from Mombasa, also early in the year.

Apart from these three cases the Colony, so far as was known as the end of the year, had been free from the disease. From information received subsequent to the end of the year it would appear, however, that some time in December the infection was introduced into the south eastern part of the Northern Frontier District and was present then among one of the nomadic Somali tribes who inhabit that part of the Colony.

**Syphilis and Yaws.**

The comparative returns for these two diseases for the years 1932 and 1933 are as follows :—

	1932	1933
Syphilis	21,299	23,547
Yaws	80,126	61,172

Whether either the increase or the decrease was actually so great as the figures would seem to show in the case of these diseases is probably doubtful. There is, however, a general concensus of opinion among medical officers that the incidence of yaws is becoming lower, and the fact that the number of cases reported as having been treated has dropped from about 103,000 in 1930 to 61,000 in 1933, while the number of cases reported as syphilis has remained practically steady and the number of dispensaries has increased lends support to that view.



**Tuberculosis.**

The comparative table of cases treated is as follows :—

<i>Year</i>	<i>Cases</i>	<i>Year</i>	<i>Cases</i>
1929 ...	676	1932 ...	886
1930 ...	756	1933 ...	969
1931 ...	874		

It would be unwise to draw any conclusions from this table.

**Leprosy.**

Four hundred and thirty-two cases of leprosy received treatment during the year.

**Enteric.**

No outbreaks of any magnitude occurred during the year. The total number of cases treated was as usual small, being 123 as against 153 in 1932. Twenty deaths occurred among these cases.

**Dysentery.**

The comparative table for the past three years is as follows :—

	<i>Cases</i>	<i>Deaths</i>
1931 ...	1,233	34
1932 ...	594	25
1933 ...	1,624	41

The increase noted in 1933 was general and was not due to any particular outbreak.

The classification of cases is as follows :—

	1932	1933
Amoebic ...	235	744
Bacillary ...	52	218
Undefined ...	307	662

**Diphtheria.**

Six cases were treated as against fourteen in 1932.

**Cerebro-Spinal Fever.**

Only twenty-two cases were treated and no epidemic occurred.

**Anthrax.**

The total number of cases treated was ninety with five deaths.

**Undulant Fever.**

Only seven cases were reported.

**HELMINTHIC DISEASES.**

	1932	1933
Ankylostomiasis ...	1,229	1,606
Ascariasis ...	6,750	7,515
Taeniasis ...	15,725	19,007
Schistosomiasis ...	252	351
<i>Totals</i> ...	26,088	30,412

These figures represent the total numbers of cases treated. That there has been an increase in the number of cases treated is satisfactory, but in this connection it is necessary to remember that in the case of no other

*ERRATA.*

On page 36, the totals for Helminthic Diseases  
should read:—

1932	...	23,956
1933	...	28,479





common disease of the people is so small a proportion of the infected treated each year as in the case of infestation with intestinal worms. Probably two millions at least out of our population of three million Africans suffer to some degree from infection with worms while each year we treat only about 30,000 and not improbably each year a large proportion of the treated become re-infected. What we are doing has undoubtedly great value as propaganda and also great value in that to 30,000 folk at least some respite, however short, is given from the results of infection, but the amount of the treatment provided is deplorably insignificant in comparison with what is required.

It is in no note of pessimism, however, that this short account of the measure of treatment which has been provided by the Medical Department for the people during 1933 ends with emphasis on its inadequacy with regard to what is probably the commonest of their diseases. The chief difficulty of providing treatment for patients suffering from infestation with intestinal worms lies in the dangerous nature of the more effective drugs. In the Annual Report for 1932 it was noted that on that account till either we had less dangerous drugs or a larger staff of qualified medical officers the great majority of the population must remain untreated. That statement is still largely true, but to-day it requires modification for a year's experience of the work of the African hospital assistants, who came into the field for the first time in 1933, suggests that it should not long remain impossible to undertake the dispensary treatment of helminthiasis on a wider scale with reasonable safety. Even so, however, if the scale is to be wide enough a very greatly increased qualified staff will be required for supervision.

### VITAL STATISTICS.

The non-native population of the Colony was determined by census in March, 1931, when the following figures were obtained :—

European	...	...	...	16,812
Asians and Arabs	...	...	...	55,789

The African population is estimated at over three millions.

### REGISTRATION OF BIRTHS AND DEATHS.

The position in connection with the registration of births and deaths remains unsatisfactory. The existing legislation on the matter has not been put into effect as the necessary machinery has not been set up. The position is in fact so unsatisfactory that the Medical Officer of Health of Mombasa records his inability to strike a death rate for the town. In other towns, however, where some information is obtainable from other sources, health officers have ventured on some analysis. The statistical material, however, is in all cases so unreliable or so limited that with the possible exception of Nairobi it is unsuitable for comparative purposes.

The death rates per 1,000 of the population for Nairobi as given in the Medical Officer of Health's Report are as follows :—

	1932	1933
Crude Death Rate (All Races) .. ..	13·51	17·84
Recorded Death Rate (All Races) .. ..	11·08	14·08
Recorded Death Rate (Europeans) .. ..	5·63	7·19
Recorded Death Rate (Asians) .. ..	13·57	14·89
Recorded Death Rate (Africans) .. ..	10·79	15·05

In Nairobi the recorded death rates for all races have shown a marked decrease during the past ten years largely due to a decrease in the African death rate. This is what one would have expected from the very considerable sanitary improvements which have been carried out during these years, but in the absence of comparative figures for the age constitution of the population and much other data it would be unwise and probably misleading to attempt to evaluate precisely the degree of improvement in the public health.



For the great African population in the native reserves no detailed figures are available other than those already given for the districts of Digo and Masailand.

TABLE SHOWING THE SICK, INVALIDING AND DEATH RATES AMONGST EUROPEAN OFFICIALS IN THE COLONY AND PROTECTORATE OF KENYA

	1931	1932	1933
Total Number of Officials Resident .. .. .	2,228	1,919	1,756
Average Number Resident.. .. .	1,647	1,497	1,340
Total Number on Sick List .. .. .	1,206	1,013	946
Total Number of Days on Sick List .. .. .	9,040	6,753	5,956
Average Daily Number on Sick List .. .. .	24.76	18.45	16.32
Percentage of Sick to Average Number Resident ..	1.50	1.23	1.21
Average Number of Days on Sick List to each Patient..	7.49	6.63	6.29
Average sick time to each Resident .. .. .	5.48	4.51	4.44
Total Number Invalided .. .. .	15	6	5
Percentage of Invaliding to Total Residents .. ..	.67	.31	.28
Total Deaths .. .. .	5	3	3
Percentage of Deaths to Total Residents.. .. .	.22	.15	.17
Percentage of Deaths to Average Number Resident ..	.30	.20	.22
Number of Cases of Sickness contracted away from Residence .. .. .	—	—	—

TABLE SHOWING THE SICK, INVALIDING AND DEATH RATES AMONGST NON-EUROPEAN OFFICIALS IN THE COLONY AND PROTECTORATE OF KENYA.

	1931	1932	1933
Total Number of Officials Resident .. .. .	3,240	2,797	2,457
Average Number Resident.. .. .	2,706	2,314	2,103
Total Number on Sick List .. .. .	3,711	2,249	1,965
Total Number of Days on Sick List .. .. .	19,030	11,608	9,532
Average Daily Number on Sick List .. .. .	52.27	31.71	26.11
Percentage of Sick to Average Number Resident ..	1.93	1.37	1.24
Average Number of Days on Sick List to each Patient ..	5.14	5.16	4.85
Average sick time to each Resident .. .. .	7.05	5.01	4.53
Total Number Invalided .. .. .	11	5	7
Percentage of Invaliding to Total Residents .. ..	.34	.81	.28
Total Deaths .. .. .	7	5	4
Percentage of Deaths to Total Residents.. .. .	.21	.18	.16
Percentage of Deaths to Average Number Resident ..	.25	.22	.19
Number of Cases of Sickness contracted away from Residence .. .. .	—	—	—

III.—HYGIENE AND SANITATION.

A.—General Review of Work Done and Progress Made.

(1) PREVENTIVE MEASURES.

MOSQUITO AND INSECT-BORNE DISEASES.

Malaria.

No new work of importance was embarked upon during 1933. Routine investigations were carried on in most parts of the Colony by the Entomologist and routine methods of prevention were carried out where necessary so far as funds and staff allowed. In the native reserves minor measures of drainage and minor schemes for the conservation of small water supplies were instituted where sanitary inspectors were available.

Trypanosomiasis.

Clearing of watering places and fords was continued during the year in the Central and South Kavirondo Districts. A commencement was also made with a large experiment of prevention based on the elimination of fly by trapping.

EPIDEMIC DISEASES.

Plague.

The incidence of the disease throughout the year was very low and no unusual preventive measures were in operation.

**Smallpox.**

Only three cases occurred. The number of vaccinations performed was 12,362.

**Dysentery and the Enteric Fevers.**

No notable outbreaks of these diseases occurred, and no special preventive measures were called for.

**Tuberculosis.**

No *ad hoc* preventive measures are in operation against tuberculosis.

**HELMINTHIC DISEASES.****Ankylostomiasis, Ascariasis and Taeniasis.**

During the year much work was done in many districts with regard to the institution of latrines.

**Schistosomiasis.**

In districts provided with European sanitary inspectors some preventive work was undertaken in the course of the conservation and protection of water supplies.

**(2) GENERAL MEASURES OF SANITATION.**

There is nothing new to record regarding sewage disposal, scavenging, refuse disposal, drainage, water supplies, etc., either in the urban or the rural areas of the Colony during the year.

**(3) SCHOOL HYGIENE.**

There is now no school medical service, and school medical inspection is only undertaken to the extent that district medical officers may be able to find time for the purpose. The amount of work done is considerable, but it falls far short of what is required.

**(4) LABOUR CONDITIONS.**

Labour conditions on estates, on the Railway, and in the townships have remained much as in the preceding two years as employers of labour have had no funds at their disposal for major improvements. No serious outbreaks of disease occurred during the year among employed labourers. Among the most important of the conditions which affect the welfare of the labouring classes in Kenya as elsewhere is wages, and in Kenya, as in all countries where the labouring classes are very poorly educated, the average wage of the worker, and more especially the unskilled worker, is low. Where as on the larger estates housing and feeding can be organized a low wage may not militate greatly against health, but in the urban areas where the worker is left largely to his own devices it is far from easy for him either to feed and cloth himself in any adequate fashion, or to secure good accommodation, while if he be a married man with a family his difficulties are exceedingly great. The very real difficulties with which the urban dwelling African is faced in the matter of food supplies will be made more clear in the section of this Report which deals with food in relation to health and disease.

**(5) HOUSING AND TOWN PLANNING.****Housing.**

No major housing schemes were adopted during the year in the urban areas. In the Native Reserves, however, many improved houses were erected, and the movement for better houses is growing, partly as a result of example, partly as a result of definite propaganda on the part of this department, and of other departments and bodies engaged in social and educational work. A large number of these new houses are in many ways surprisingly good, and with a return of prosperity great progress should soon be evident.

**Town Planning.**

No schemes were inaugurated during the year.



**(6) FOOD IN RELATION TO HEALTH AND DISEASE.****Inspection and Control.**

Routine inspection was carried out as usual.

**Markets, Dairies and Slaughter Houses.**

In Nairobi an excellent new and up-to-date slaughter house was erected.

In the native reserves much work was done by the European Sanitary Inspectors and by the Administration to improve conditions at native markets. Much, however, remains to be done.

**Food Supplies.**

The chief issue with regard to food in relation to health and disease is not yet, however, at least so far as the great bulk of the population is concerned, either how food is sold, or how food is inspected, but how food is to be obtained. It is difficult to over-emphasize the importance of this matter, which constitutes perhaps the most outstanding public health problem in Africa, for not only has the question of the food supply a great and direct bearing on the public health, but very directly it has a bearing also on all economy.

Dealing firstly with those African peasants who are for the moment essentially agriculturists, the position is that their food supplies on account of bad farming, lack of knowledge as to the maintenance of the fertility of the soil, and lack of any considerable cash reserves, far more than on account of the vagaries of the weather, or the depredations of locusts, are only too frequently deficient in quality, while, again on account of bad farming, and very especially on account of their lack of knowledge of animal husbandry, and of the real uses of cattle either as a direct source of food supply, or for the purposes of farming, their dietaries are ill-balanced. The diet of the African agriculturist and of his family is as a general rule deficient in two things at least, animal fats, and first class protein, and not infrequently in salts and green vegetables as well. The chief reason for these deficiencies in most areas is because as a rule the African peasant grows his crops in one place and keeps his cattle in another, or at least so organizes his husbandry that the effect is separation, and so he loses both milk, and flesh, and manure, and greens. When the peasant becomes a good mixed farmer, and appreciates the real uses of his cattle then only will he and his family be more adequately fed. Furthermore, until the peasant becomes a good mixed farmer he will not be prosperous, and so able to supplement his dietary by the purchase of articles which he cannot grow. Among the pastoral people a similar, if reversed, position holds, for in the absence of agricultural skill both they and their cattle lack an adequate supply of carbohydrates and green vegetables. These are generalisations which both health and agricultural officers know to be only too true.

In the case of the urban African we can come down to figures and be more particular.

In November of 1933 there was issued by the Nutrition Committee of the British Medical Association a Report containing a number of simple diets which had been constructed by the Committee with a view to indicating what, in the Committee's opinion, the minimum dietaries of a working class family in England ought to be if health and working capacity were to be supported. The dietaries were detailed in the Report and estimates of costs provided.

Using these dietaries as a basis we have prepared similar dietaries for Africans living in Nairobi, substituting, however, foodstuffs locally available and likely to be used by Africans, and we have estimated the probable cost. In considering the results obtained two factors must, however, be borne in mind, firstly, that the Nutrition Committee's dietaries have been criticised as being constructed on too generous a scale with regard to certain food constituents even for Europeans, and, secondly, that we have as yet no precise knowledge as to what the food requirements of the African may be under any particular condition : to these points reference will be made again.

Only the first of the Nutrition Committee's diets need be considered in detail. This diet was as follows :—

DIET No. 1—BARE RATION—NO VARIETY

ITEM	Quan- tity	Price B.M.A. Mean	Price Stockton Mean	Protein	Fat	Carbo- hydrate	Calories
	<i>Lb.</i>	<i>s. d.</i>	<i>s. d.</i>	<i>Grams</i>	<i>Grams</i>	<i>Grams</i>	
Corned Beef .. ..	1	6	6	119·2	84·8	—	1,278
Cheese .. ..	2	1 1	1 0	233·2	317·6	28·2	4,022
Margarine .. ..	$\frac{3}{4}$	3	3	0·7	288·5	—	2,684
Flour <i>or</i> .. ..	7	..	8	320·6	51·1	2,397·5	11,620
Bread .. ..	11 $\frac{1}{4}$	1 7 $\frac{3}{4}$	..	(367·9)	(10·1)	2,454·8)	(11,666)
Sugar .. ..	1 $\frac{3}{4}$	4	4	—	—	793·8	3,255
Potatoes .. ..	3 $\frac{1}{2}$	2 $\frac{1}{2}$	1 $\frac{1}{2}$	30·1	0·4	287·4	1,306
Yeast .. ..	—	—	1	—	—	—	—
Tea .. ..	$\frac{1}{4}$	3	2 $\frac{1}{2}$	—	—	—	—
Fresh Fruit and Green Vegetables .. ..	—	7	7	—	—	—	100
Total Weekly Quantities .. ..	—	4 10 $\frac{1}{4}$	3 9	703·8	742·4	3,506·9	24,265
Daily Quantities per Man .. ..	—	—	—	100·5	106·1	501·1	3,466

Total first class protein .. .. 352·4 grams  
Daily first class protein .. .. 50·3 grams  
Cost per man per week (B.M.A. mean) .. 4/10 $\frac{1}{4}$ d.  
Cost per man per week (Stockton mean) .. 3/9d.

The Committee makes the following note with regard to this dietary :—  
“DIET No 1—*Note.*

“Diet No. 1 gives quantities of protein, fat, and carbohydrates, and of total calories adequate to support health and working capacity. This diet, though adequate in its principal constituents may be deficient in vitamins and minerals but the principal defect lies in the small number of its constituent foodstuffs. Though perhaps palatable for a period of one week it would with longer use rapidly become monotonous and nauseous. In order to avoid the repugnance which would inevitably follow the prolonged ingestion of such a diet, and to assure adequacy of vitamins and minerals, it is necessary to increase the number of foodstuffs so as to obtain greater variety.”

A similar diet constituted from articles of food such as Africans might be expected to purchase in Nairobi would be as follows :—

AFRICAN DIET No. 1

CONSTITUENT	Weight		Protein	Fat	Carbo- hydrates	Calories	Cost
	<i>Oz.</i>	<i>Grams</i>	<i>Grams</i>	<i>Grams</i>	<i>Grams</i>		<i>Sh. cts.</i>
Beef .. ..	56	1,587·6	280	84	—	1,932	87
Maize Meal .. ..	126	3,572·1	309·75	170·1	2,556·19	13,328	56
Potatoes .. ..	56	1,587·6	22·4	—	308·00	1,351	28
Beans .. ..	14	396·9	91·0	5·6	222·11	1,337	09
Ghee .. ..	15·75	446·6	—	41·0	—	4,102	59
Sugar .. ..	14	396·9	—	—	392·0	1,610	22
Vegetables .. ..	28	793·8	11·2	1·4	35·0	203	18
Salt .. ..	3·5	99·4	—	—	—	—	02
Tea .. ..	3·5	99·4	—	—	—	—	28
Total per week ..	—	—	714·35	702·1	3,513·3	23,863	3 09
Total per day ..	—	—	102·05	100·3	501·9	3,409	44
Cost per month ..	—	—	—	—	—	—	13 25

NOTES.—For corned beef and cheese ordinary beef has been substituted.  
The beef calculations are based on Plimmer's figures for half carcase.  
Ghee is substituted for margarine.  
Beans and maize meal are substituted for flour.



The lowest cost given for Diet No. 1 in England is 3/9d. per man per week (Stockton mean). The cost of the Nairobi variation of this diet is estimated at 3/1d. per week or 13/4d. per month.

The Nutrition Committee, however, described its No. 1 Diet as a "bare ration" which though adequate in its principal constituents with the possible exceptions of minerals and vitamins is seriously defective in that on account of the small number of its constituents it would, if used for longer than a week, become rapidly monotonous and nauseous.

African Diet No. 1 has an equally small number of constituents and whether or not its content of protein, fat, and carbohydrate be larger than is necessary for Africans it would be equally monotonous. A first question therefore arises, is this monotony of moment in the case of Africans whose ordinary diets are as an all but universal rule incredibly monotonous? In answer to that question all that can be said at the moment is that though dyspepsia hardly figures in our returns of cases of diseases treated it is the experience of all medical officers that hardly any condition is more common among Africans. The condition does not figure in our returns not because it is uncommon, but because it is universal, and because under existing conditions its treatment is as a rule impossible, while in almost all cases the patient suffers in addition from some other disease of which alone he complains. The causes of this condition may be many, intestinal worms may be one cause, bad cooking is certainly another, may not an incredibly monotonous diet be a third? In any case we have no reason to suppose that because the African knowing nothing better does not find a monotonous dietary nauseous he would not be infinitely the better of a varied one. But our African No. 1 diet, compared with what the average African obtains ordinarily in Nairobi, is not monotonous but varied, and infinitely better balanced, and this while for an English working man the Nutrition Committee could only discard their No. 1 diet as inadequate in minerals and vitamins, and likely to become unpalatable and nauseous after a week.

A second question arises, can the African afford 13/4d. per month for the Nairobi variation of the "bare ration"? The average wage of Africans working in Nairobi is between Sh. 17 and Sh. 18 per month! It is not easy to generalise with regard to the urban African's budget and income, for some are provided with free quarters; nevertheless, many who do not receive free quarters have an income not exceeding Sh. 18 per month. The cheapest quarters which an African can rent in Nairobi cost as a rule at least Sh. 5 per month; and so we arrive at the following :—

			<i>Budget</i>	<i>Average Income</i>
			<i>s. d.</i>	
Food	...	...	13 4 per mensem	Sh. 18 per mensem.
Lodging	...	...	5 0 per mensem	
Poll Tax	...	...	1 0 per mensem	
<i>Total</i> ...			<hr/> 19 4 per mensem <hr/>	

But perhaps the "bare ration" of the Nutrition Committee is as some of its critics have suggested more than a "bare ration", while quite possibly for the smaller-sized African at least it may be on the generous side. If this be so then it is just possible that the urban African, provided he be a bachelor, may be able to get along, though very clearly he can have but little to spare for soap, or light, or clothes, or education, or recreation. Is it likely that in these circumstances he will spend enough on good food?

Let us pass to the other dietaries, the dietaries which the Nutrition Committee considered adequate, and to the dietaries for the married man with children.

The next diet, Diet No. 2, is the suggested Adult Ration; its minimum cost in England is rather over Sh. 24 per man per month. In Nairobi its equivalent would cost practically the same, and the average African could not therefore even consider it.

These and the remaining diets, their costs, and the costs of their equivalents in Nairobi are summarized in the following table :—

THE COSTS IN NAIROBI AND ENGLAND OF THE MINIMUM DIETS SUGGESTED BY THE NUTRITION COMMITTEE OF THE BRITISH MEDICAL ASSOCIATION IN 1933

Diet No.	RATIONS	Cost in England per Week	Cost of Nairobi Equivalent per Week	Cost of Nairobi Equivalent per Month
		<i>Sh. d.</i>	<i>Sh. d.</i>	<i>Sh. d.</i>
1	Bare Ration, 1 adult .. ..	3 9	3 1	13 3
2	Suggested Ration, 1 adult .. ..	4 11 $\frac{3}{4}$	5 9 $\frac{3}{4}$	24 11
5	Child, 2-3 years .. ..	2 9	1 7 $\frac{1}{4}$	6 10
6	Child, 3-6 years .. ..	2 11 $\frac{3}{4}$	1 8 $\frac{3}{4}$	7 5
7	Child, 6-8 years .. ..	2 11 $\frac{3}{4}$	1 11 $\frac{3}{4}$	8 6
8	Child, 8-10 years .. ..	3 6 $\frac{3}{4}$	2 10 $\frac{1}{4}$	12 3
10	Man, wife and one child, 2-3 years .. ..	10 11 $\frac{1}{2}$	9 0 $\frac{1}{4}$	38 8
11	Man, wife and one child, 3-6 years .. ..	11 3	9 9	41 9
12	Man, wife and one child, 6-8 years .. ..	11 3 $\frac{1}{2}$	10 6	45 0
13	Man, wife and one child, 8-10 years .. ..	11 7	11 1 $\frac{1}{4}$	47 6
14	Man, wife and three children, 1-2 years, 2-3 years, and 3-6 years .. ..	16 5	13 3	56 9
15	Man, wife and three children, 1-2 years, 6-8 years, and 8-10 years .. ..	16 5 $\frac{1}{4}$	14 6 $\frac{3}{4}$	62 5
16	Man, wife and three children, 6-8 years, 10-12 years, and 12-14 years .. ..	18 5	16 7	71 1

Or more shortly :—

The Nairobi equivalent of—

Bare ration, 1 adult, costs 13/4 per month.

Suggested ration, 1 adult, costs 24/- per month.

Diet for man, wife and one child, costs from 38/6 to 45/- per month.

Diet for man, wife and three children, costs from 47/6 to 71/- per month.

The diets we have been considering may, as was noted earlier, be on the generous side for Europeans, and they may with more probability be too generous for adult Africans, but they are not elaborate, they are in fact as simple as diets can be if they are to be balanced. Let us suppose that we cut each ration down in quantity by 20 per cent, and that such a reduction in quantity resulted in a reduction in price of 20 per cent, the suggested adult ration would then cost Sh. 19, and the ration for a man, his wife and three children of 6 to 8, 10 to 12, and 12 to 14 years, Sh. 56 per month.

Twenty per cent on the figures we have been considering is, however, beyond all doubt far outside the margin of probable error and it would appear therefore to be very clear that for the average African in Nairobi it is, so soon as he has a wife to keep as well as himself, an impossibility to secure anything in the nature of an adequate diet.



### **B.—Measures Taken to Spread the Knowledge of Hygiene and Sanitation.**

Large numbers of pamphlets in English and Kiswahili were issued during the year. At the end of the year a very comprehensive "Development Exhibit" was staged at the December Show of the Royal Agricultural and Horticultural Society of Kenya which was held in Nairobi. This exhibit was arranged by the Agricultural, Education, Forestry, Medical and Post Office departments in co-operation, and took the form of a part of an African village. Not the African village of to-day, but the village of the future. The object of the exhibit was to illustrate Sir Horace Plunket's dictum: "Better living, better farming, better business". The illustration was effected by means of a full-sized burnt brick cottage homestead fronting on a "village green", round which were arranged the agricultural and animal husbandry exhibits, a dispensary or "Primary Health Centre", a village school, a blacksmith's and a carpenter's shop, the "general" village shop, a tailor's shop, a post office where the working of the savings bank was explained, a booth where the working of co-operative and credit societies was explained, a tree planting exhibit, and a restaurant where a balanced dietary was provided. In illustration of the other methods necessary for the achievement of that "better farming" without which better living would remain impossible, the Agricultural Department arranged to open their full-sized Model Small Holding in the grounds of the Scott Agricultural Laboratories, which are in the immediate proximity of the Showground, to the public for the days of the Show, and connected up the Small Holding and the Development Exhibit by a flagged road. The Exhibit by these means became a complete demonstration of Government's development policy for the average agricultural native reserve.

At each item of the Exhibit there were posted African employees of the Departments responsible for the particular activity illustrated, who discoursed at length, not only each on his own exhibit, but on its particular relations to each of the other exhibits. Parties of chiefs, headmen, and Local Native Councillors from all over the Colony were personally conducted round the Exhibit in a systematic fashion, and there has been evidence since that the Exhibit as a whole was a source of inspiration to more than a few.

### **C.—Training of Sanitary Personnel.**

The systematic training of Africans to be Dispensary Health Workers was continued throughout the year at the Jeanes School. If married, these lads have their wives with them at the school, and the wives also receive certain training in domestic hygiene, cooking, and child welfare which will enable them to make their husband's homes practical examples of what they are expected to teach.

### **D.—Recommendations for Future Work.**

At the present time when far from being able to engage on new ventures involving either additional staff, or constructional works, it is only with difficulty that either Government or the statutory Local Authorities of the settled areas, or the Local Native Councils in the reserves can find the funds necessary for the maintenance of their existing sanitary staffs and services, it would be out of place and purposeless to make recommendations with regard to any of the multifarious specific works which require to be undertaken in the interests of health in all parts of the Colony, and among all communities. All that it is practical to recommend for the moment is firstly that every endeavour should be made to ensure that the standard and amount of services now being rendered either by the Local Native Councils, the statutory Local Authorities, or Government, should be maintained undiminished until further expansion may again be possible, and secondly that every endeavour should be made so to improve the economic position of the African peasant that expansion may again, and at no distant date, become a matter of practical politics.

#### IV.—PORT HEALTH WORK AND ADMINISTRATION.

The number of vessels which entered Kilindini or Mombasa Harbours during the past three years was as follows :—

	1931	1932	1933
Steamships .. .. .	584	515	599
Dhows .. .. .	1,500	1,506	1,385

Steamship Tonnage—1,820,709

Dhow Tonnage—27,227

Vessels Medically Inspected on Arrival .. .. .	143
Dhows Medically Inspected on Arrival .. .. .	74
Vessels Arriving in Port Infected or Suspected .. .. .	3
Vessels placed under Quarantine Restrictions or Subjected to Special Sanitary Measures .. .. .	2
Passengers Medically Examined under Special Small-pox Regulations .. .. .	6,761
Passengers Detained under Observation .. .. .	Nil
Passengers Landed Subject to Surveillance .. .. .	39
Bills of Health Issued .. .. .	913

#### PORT HEALTH STAFF.

Up till April a Senior Health Officer and a Health Officer acted as part time Health Officer and Assistant Port Health Officer, respectively. After April the staff employed on port health duties was as follows :—

- (a) Health Officer employed as part time Port Health Officer.
- (b) Sub-Assistant Surgeon (part time).
- (c) Clerk.
- (d) Two Orderlies.
- (e) Mosquito Searcher.
- (f) Rat Catcher.
- (g) Office Boy.

No Sanitary Inspector was available for duty.

#### EXAMINATION OF SHIPS ON ARRIVAL.

No alteration was made in the system established in 1932 and described in the Report of that year.

#### INTELLIGENCE.

The weekly epidemiological bulletin broadcasted by the League of Nations, Eastern Bureau, at Singapore, was received regularly and no serious defects in transmission were experienced.

#### INFECTIOUS DISEASES IN VESSELS.

*Steamers.*—Two steamships arrived with large numbers of cases of measles on board. The ships were given restricted pratique.

One vessel arrived from Durban having landed a case of smallpox at her previous port of call. Twenty-six first class, four second class, and nine deck passengers were landed under surveillance.

*Dhows.*—On the 16th February a case of smallpox was discovered in the town, which on enquiry was found to have landed from a dhow from the Arabian Coast fourteen days previously while still in the incubation stage. Further enquiries carried out on the return of the dhow from the south elicited a story to the effect that between the time this dhow had left Arabia and reached Mombasa a case of smallpox had occurred, died and been buried at sea, these facts having been concealed on arrival. No further cases occurred in the Port.



### INFECTIOUS DISEASES IN THE PORT.

Apart from the imported case of smallpox referred to above the Town and Port of Mombasa remained free from dangerous infectious disease throughout the year.

### SPECIAL PREVENTIVE MEASURES AGAINST THE INTRODUCTION OF INFECTIOUS DISEASE.

Regulations in reference to the landing of passengers from India continued in force and were unchanged throughout the year.

### SANITARY CONDITIONS OF THE PORT.

The Port area, wharves, sheds, etc., were maintained in a very satisfactory sanitary condition throughout the year.

### RAT DESTRUCTION.

Rats though present in the Port area, were not numerous. The structural and sanitary conditions of the wharves and sheds is excellent and not such as to encourage undue breeding.

Rats trapped ... 6,700	Rats examined ... 481
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No evidence of plague infection was found in any of the rats examined.

### MOSQUITO BREEDING.

The Port area and small craft were constantly searched for mosquito breeding. The whole area is well drained and mosquito breeding never assumes serious proportions.

### IMPORTATION OF USED CLOTHING.

One hundred and ninety consignments were passed on their accompanying certificates of disinfection. Three consignments were stopped but were released after examination.

### INSPECTION OF IMPORTED FOODS.

Owing to the services of a Sanitary Inspector not being available no routine examination of imported food was undertaken.

## V.—MATERNITY AND CHILD WELFARE.

Maternity and Child Welfare work is carried out by three groups of agencies as follows :—

- (a) The Government Medical Department.
- (b) The Missionary Societies.
- (c) The Lady Grigg Welfare League.

Government expenditure on this work is not, however, limited to that which is incurred by its own Medical Department in providing services rendered by Government officers. Three Missionary Societies receive Government Grants for general medical work which are doubtless of assistance in enabling these societies to provide maternity relief, while much work of very great value with regard to the promotion of child welfare in the rural areas is carried out by the Jeanes teachers in respect of a portion of whose salaries the Missionary Societies are in receipt of grants from the funds of the Department of Education.

The African Maternity Centre at Pumwani in Nairobi, the Indian Maternity Home, Nairobi, and the African Maternity Centre at Mombasa, which are branches of the Lady Grigg Welfare League, receive £1,350, £250 and £700 per annum, respectively, from Government funds.

**Departmental Work—Urban.****STAFF RETAINED BY GOVERNMENT.**

*Nairobi.*—One woman medical officer and two European health visitors, and African staff.

*Mombasa.*—One woman medical officer and two European health visitors, and African staff.

*Eldoret.*—One European health visitor, and African staff.

**ATTENDANCES AT URBAN CHILD WELFARE AND ANTE-NATAL CENTRES AND HOUSE VISITS**

	1931	1932	1933
NAIROBI (3 Centres)—			
Attendances .. .. .	33,101	40,292	35,325
House Visits .. .. .	7,555	3,646	4,373
MOMBASA (5 Centres)—			
Attendances .. .. .	11,284	30,388	28,163
House Visits .. .. .	11,166	12,750	17,989
ELDORET (2 Centres)—			
Attendances .. .. .	—	10,831	9,278
House Visits .. .. .	—	6,001	4,704

The work at all the urban centres has shown progress during the year, for though there has been a general decrease in attendance this has been due not to any lack of popularity of the centres but to a diversion of a larger number of cases which were properly dispensary cases to these institutions, thus leaving more time for genuine child welfare work and house visiting. Yearly the educational value of the centres is increasing. The type of work undertaken at the centres, and by the health visitors and their African staff in the course of house visits is very similar to that which is undertaken by any child welfare organization anywhere in England with this difference only, that on account of greater poverty, greater ignorance, and worse housing, it is more difficult of performance in Africa. In the Annual Report for 1932 these difficulties were described at some length and the remedies detailed. At the end of 1933 the position remains unaltered and the great needs of the town population are still as then for—

- (i) compulsory education,
- (ii) higher wages and better housing,
- (iii) more maternity beds, and
- (iv) more hospital beds for sick children.

**Departmental Work—Rural.**

Some maternity and child welfare work is carried out at all native reserve hospitals to which European nursing sisters have been posted, while at two out-dispensaries in Central Kavirondo African midwives have been posted and a few beds provided for maternity cases. These ventures have been very successful, and it is now very clear that if African midwives could be trained in numbers their services could be utilized. Enough midwives can never, however, be trained in Nairobi, and it has been suggested therefore that as soon as possible small maternity training centres should be established in connection with all the native reserve hospitals. During the course of the year one Local Native Council, that of South Kavirondo, made provision in its Estimates for 1934 for a sum of £500 to be expended on such a project, and there is little doubt that if the financial position were such that a proportion of the expenditure on such services could be met by Government in respect of all reserves there would be a generous response from almost all Local Native Councils throughout the Colony.



The Work of Missionary Societies.

The medical missions throughout the Colony provide in most cases some maternity relief, and carry out some child welfare work. The total amount of maternity relief is, however, comparatively small as their funds are limited. The amount of child welfare work which is carried out is, on the other hand, very considerable, and though not highly organized it is of the very greatest value. Everywhere in the neighbourhood of the missions one sees cleaner, healthier and better clad mothers and children than one sees elsewhere, and yearly as the teaching of hygiene becomes more practical and less theoretical one will see more. In this connection the work of the Jeanes teachers and their wives, directed as it is towards the education of the whole community as to how to improve their domestic conditions, how to live, and how to learn, is of inestimable value.

The Work of the Lady Grigg Welfare League.

At the African Maternity Centre at Mombasa 36 labour cases were taken during the year; at the African Centre in Nairobi 304 labour cases were taken and 12 African midwives were in training, of whom 5 qualified during the year.

At the Indian Maternity Centre in Nairobi 173 labour cases were taken and 7 midwives were in training, of whom 2 qualified during the year.

VI.—HOSPITALS, DISPENSARIES, OUT-DISPENSARIES, THE MENTAL HOSPITAL, MEDICAL WORK. CARRIED OUT BY MISSIONARY SOCIETIES, Etc.

In 1933 the total number of *new cases* treated at Government Hospitals, Hospital Dispensaries, and Out-Dispensaries for the first time exceeded 1,000,000. The actual number was 1,112,864, or rather more than a third of the population of the Colony. This total exceeds the figure for 1931 by 287,445, and this increased number of patients was treated in spite of the facts that expenditure had been reduced by £21,634, and the number of the medical staff by eleven since that year.

The details of the numbers of patients treated at Government Hospitals, Dispensaries, and Out-Dispensaries during the year are shown in the accompanying Table, and the totals there shown, with the exception of the totals for European patients, exceed, it may be noted, not only the totals for the year 1932 but the totals for any preceding year in the history of the Colony. The comparative figures, together with the figures for the number of qualified medical staff, and the figures of expenditure for the past three years were as follows :—

	Actual Expenditure	Qualified Medical Staff	European		Asiatic and African		Out-Dispensary Patients
			In-patients	Out-patients	In-patients	Out-patients	
1931 ..	£ 221,202	66	2,626	1,777	35,551	252,610	534,709
1932 ..	197,260	54	2,375	1,595	31,382	261,795	646,033
1933 ..	199,568	55	2,182	1,327	36,443	300,277	774,302

The falling off in the numbers of European patients treated is probably largely due, partly to restricted incomes, and partly to the fact that the number of European officers employed by Government has been diminished.

In 1931 the cost per patient treated, assuming that all medical funds were expended on medical relief, was 5/4d.

In 1933 the cost on the same basis was 3/7d.

In actual fact, however, the cost of medical relief per patient treated is much less than either of the figures given above since in both years a considerable proportion of the medical expenditure was devoted to preventive and educational work, quarantine administration, etc.

#### HOSPITAL AND DISPENSARY POLICY.

In the Report for 1932 there was given a fairly full account of the hospital and dispensary buildings then in existence, of the standard of nursing and treatment provided, of the out-dispensary system, and of the future development of the hospital, and out-dispensary system as it has been envisaged for some years past. Briefly summarized, the object has been to provide in respect of each 100,000 of the population—

a hospital of 100 beds,

2 doctors,

2 nurses,

6-10 out-dispensaries, each comprising a few beds and staffed by a well-trained African Hospital Assistant and an African midwife;

with on the more strictly preventive and educational side a medical officer, an European sanitary inspector, and African welfare workers: the whole being under the direction of the most senior of the three medical officers, who, whatever his particular leaning might be would function as director of the unit, and as health adviser to the local authority of the area. In 1928 a scheme devised on this basis was, as has been indicated in the section on administration, drawn up for the Colony as a whole, and was approved by Government. This scheme allowed for a certain proportion of the necessary beds being provided at suitably situated mission hospitals. The scheme, which has since that date been known as the "Health Scheme", deals only with the Native Reserves, and it may be observed that while the scheme envisaged the provision of 1,911 beds by Government, 310 by Missionary Societies, or a total of 2,210 beds in the Native Reserves, only 866 beds have so far been provided by Government and 266 by the Missions in these areas, a total of 1,132. If we add to this total the 800 beds available for Africans in the Towns and in the Northern Frontier and Turkana Districts which are not accounted for in the Health Scheme we arrive at a total of 1,832 beds already provided for a population of about 3,000,000, or about one bed per 1,500 persons when the standard suggested in the Health Scheme was one bed per 1,000, and that for Europe one bed per 400 or 500 persons.

Almost all of these hospitals are continually overcrowded, and in many cases patients have to be discharged earlier in convalescence than is desirable. In 1933 we treated about 5,000 more in-patients and about 150,000 more out-patients than in 1932. Of the in-patients many had to sleep two in a bed and not a few on the floors. Of the 150,000 extra out-patients treated in 1933 it is impossible to say how many ought to have been treated not as out-patients but admitted to hospital, but the number must have been very large. In 1934 it may be expected that we shall again treat an increased number of out-patients, and again many of these out-patients will be cases which ought to be admitted to hospital. Very clearly there is need to bring our total provision of beds up, not merely to the figure suggested in the Health Scheme, but far beyond it.

At the beginning of this section I emphasized the fact that in 1933 over 1,000,000 new cases of sickness were treated at Government institutions. It is equally necessary to emphasize the facts that of these cases the great majority were treated not by doctors, but by African dressers whose standard of competency is not yet a high one, and many thousands of these cases required not only doctoring but nursing, and should therefore have been admitted to hospital, and that they were not so admitted, not because there is now any reluctance to come into hospital, but because our hospitals were over full.



IN AND OUT-PATIENTS TREATED AT GOVERNMENT HOSPITALS  
DISPENSARIES AND OUT-DISPENSARIES IN 1933

Hospitals in Townships	In- patients	Out- patients
European Hospital, Nairobi .. .. .	645	193
Native Hospital, Nairobi .. .. .	4,389	1,811
Mathari Mental Hospital, Nairobi .. .. .	153	—
Infectious Diseases Hospital, Nairobi .. .. .	1,309	—
Prison, Nairobi .. .. .	1,134	3,764
General Dispensary, Nairobi .. .. .	—	33,331
Loco. Dispensary, Nairobi .. .. .	—	7,910
Police Dispensary, Nairobi .. .. .	—	1,325
Child Welfare Centre, Nairobi .. .. .	—	19,950
Pumwani Clinic, Nairobi .. .. .	—	1,600
District Health Office Clinic, Nairobi .. .. .	—	1,465
European Hospital, Mombasa .. .. .	229	540
Native Hospital, Mombasa .. .. .	2,469	26,713
Infectious Diseases Hospital, Mombasa .. .. .	370	2,584
Child Welfare Centre, Mombasa .. .. .	—	19,664
European Hospital, Kisumu .. .. .	164	279
Native Hospital, Kisumu .. .. .	4,497	19,870
Prison, Kisumu .. .. .	153	845
Native Hospital, Nakuru .. .. .	1,817	5,873
Native Hospital, Eldoret .. .. .	1,043	2,768
Railway Dispensary, Eldoret .. .. .	623	824
Native Hospital, Kitale .. .. .	691	3,246
TOTAL ..	19,586	154,555

HOSPITALS IN TURKANA AND NORTHERN FRONTIER PROVINCE  
AND LAMU

	In- patients	Out- patients	Out-dis- pensaries
Lodwar .. .. .	234	3,940	—
Lokitaung .. .. .	208	1,212	—
Wajir .. .. .	188	2,737	—
Moyale .. .. .	61	3,595	4,910
Lamu .. .. .	340	14,333	12,461
TOTAL ..	1,031	25,817	17,371
HOSPITALS IN NATIVE RESERVES			
Wesu .. .. .	769	6,906	14,372
Kabarnet .. .. .	224	3,133	5,383
Kitui .. .. .	1,236	8,326	64,327
Kapenguria .. .. .	234	2,770	—
Narok .. .. .	236	3,853	1,295
Malindi .. .. .	163	7,788	3,537
Kakamega .. .. .	2,205	18,406	129,336
Kilifi .. .. .	418	3,316	13,943
Kericho .. .. .	687	2,849	5,317
Machakos .. .. .	1,799	13,460	72,856
Muriranjias .. .. .	232	11,005	—
Kisii .. .. .	1,220	10,297	47,177
Nyeri .. .. .	739	16,766	—
Fort Hall .. .. .	2,148	12,310	29,964
Voi .. .. .	309	2,670	—
Meru .. .. .	1,355	16,510	90,861
Kiambu .. .. .	1,216	9,168	15,872
Maseno .. .. .	—	—	76,902
Kisumu .. .. .	—	—	33,505
Msambweni, Digo .. .. .	477	1,905	5,770
Kapsabet .. .. .	510	9,178	17,794
Keraguya .. .. .	573	12,733	89,040
Tambach .. .. .	191	1,549	—
TOTAL ..	16,929	172,228	717,231

### **MEDICAL TRAINING DEPOT, NATIVE HOSPITAL, NAIROBI.**

The systematic training of Africans for work in Government Hospitals in Kenya was first undertaken in 1929 when a training depot was established in connection with the Native Hospital, Nairobi. For the first four years, 1929-1932, the work was in many ways experimental in character, and early in 1933 the results were carefully revised by a Departmental Committee. This Committee came to the conclusion that if the object of training at the Nairobi depot was to be, as it considered it should be, the production of a capable male nurse it was desirable firstly, to modify the theoretical instruction which was tending to become somewhat advanced, and more suitable for medical students than nurses, and, secondly, to provide more practical instruction in nursing. The chief work of the year has been to give effect to these recommendations, and as a result the Nairobi hospital is now staffed almost entirely by Hospital Assistants in training, who, when they have completed a course of three years, will be drafted out into other institutions.

The training of African Laboratory Assistants, African Compounders, and African Health Workers was carried out at the Laboratory, the General Dispensary, and the Jeanes School, respectively.

### **VENEREAL CLINICS.**

Special clinics for the treatment of venereal disease in women were held weekly at Mombasa at each of five centres, and at Nairobi at each of four centres. Men are dealt with at three clinics weekly at Nairobi and at one at Mombasa. On the whole there has been progress, and increasing numbers of women are attending.

### **THE MATHARI MENTAL HOSPITAL.**

#### **THE CARE AND TREATMENT OF AMENTS AND OF PATIENTS SUFFERING FROM MENTAL DISORDERS.**

It was noted in the Annual Report for 1932 that while the business of the training and treatment of patients suffering from mental defect or disorder in the Colony was still largely a matter for the future, nevertheless the Mathari Mental Hospital was on the way to becoming a hospital in fact as well as in name, at least so far as diagnosis was concerned, and that, if the new buildings which had then been sanctioned were to be built during 1933, the account of its operation during 1933 might perhaps be removed from the section of this report dealing with prisons to that dealing with hospitals. Some of these new buildings were completed during 1933; though not all. Nevertheless, though treatment in the medical and technical sense of that term is now, even as then, still a matter for the future, I feel that it would be ungracious not only to the Visiting Physician, but to the Superintendent and his staff, both European and African, again to render this account of the work of the Institution under a heading chiefly concerned with prisons.

Undoubtedly, the Mathari Mental Hospital is still a house of detention rather than a hospital, and even as a house of detention is far from satisfactory. The majority of the buildings are old and belong to a period when asylum architecture was indistinguishable from that of prisons. Furthermore, those of the buildings occupied by Africans, besides being insanitary, provide such limited accommodation that only an average of thirty square feet can be allowed per patient, while even so some thirty to forty patients have as a rule to remain in the prisons of the Colony. In such circumstances diagnosis is difficult, the segregation of one class of patient from another impracticable, and treatment almost out of the question. But as I have noted in the section of this report dealing with the public health, mental disorder is not necessarily incurable. If that be so then it is clearly essential that in all cases where Government makes itself responsible for the segregation of the mentally disordered it should make adequate provision for their treatment. As at the Mathari Mental Hospital, which is the only institution in the Colony intended for the accommodation of the mentally disordered, such provision is still



lacking, it is clearly a matter of the most pressing urgency that at the very earliest date adequate accommodation should be provided and facilities for treatment made available. Steps are being taken by Government to provide additional wards, as funds permit.

The following notes summarize the work of the year :—

PHYSICAL HEALTH.

Amongst the European and Asian patients there was no notable physical illness except the case of a European female who mental condition on admission was found to be due to a head injury necessitating operation, and the case of an Indian suffering from myocardial degeneration. Of the African patients twenty males and two females received treatment for physical illness. The cases included seven of influenza, four of pneumonia, one of typhoid fever, and one of suspected pulmonary tuberculosis.

DEATHS

PERCENTAGE OF DEATHS TO TOTAL OF PATIENTS 1926 TO 1933

				Patients	Deaths	Percentage
						<i>Per cent</i>
1926	..	..	..	208	38	18·3
1927	..	..	..	204	32	15·7
1928	..	..	..	225	23	10·2
1929	..	..	..	250	25	10
1930	..	..	..	278	34	13·6
1931	..	..	..	236	38	16
1932	..	..	..	167	10	6
1933	..	..	..	153	5	3·26

The mental affections of the five patients who died in 1933 were :—

- 1 Indian (Male) : dementia paralytica (G.P.I.)
- 2 African (Males) : dementia paralytica (G.P.I.)
- 1 African (Male) : premature dementia (dementia praecox)
- 1 African (Male) : unclassified.

CLASSIFICATION OF PATIENTS

EUROPEANS				Males	Females
Dementia (secondary)	..	..	..	1	—
Premature Dementia	..	..	..	1	1
Manic Depressive Psychosis	..	..	..	—	1
Melancholia	..	..	..	1	1
Alcoholic Psychosis	..	..	..	2	—
Traumatic Psychosis	..	..	..	—	1*
Imbecility (with epilepsy)	..	..	..	1	1
Unclassified	..	..	..	—	1
ASIANS					
Dementia Paralytica	..	..	..	1	—
Manic Depressive Psychosis	..	..	..	1	1
Premature Dementia	..	..	..	—	1
Unclassified	..	..	..	1	—

\*This case was transferred to the European Hospital and re-admitted after operation.

AFRICANS.

Classification of these has not been completed owing to the time occupied in the special inquiry into the prevalence of neurospirochaetosis referred to in my last Annual Report.

This inquiry was reported to the Neurological Section of the Royal Society of Medicine on 16th November, 1933, and the report is published in the Transactions of the Society for January, 1934.

DISCHARGES

EUROPEANS				Males	Females	Remarks
Unchanged	..	..	..	1	3	One to England, one to South Africa, one to the European Hospital, and one to the care of relations.
Improved	..	..	..	1	1	One to England, and one to the care of relations.
Recovered	..	..	..	—	1	
ASIANS	..	..	..	None	None	

CLASSIFICATION	Unchanged	Improved	Recovered
AFRICANS—MALES			
Amentia (feeble-minded) ...	1	—	—
Amentia (feeble-minded: hysteria) .. ..	—	1	—
Amentia (feeble-minded: premature dementia) ..	—	1	—
Premature dementia .. ..	—	4	—
Toxic psychosis (Indian hemp)	—	1	—
No mental disability found ..	—	—	1
Unclassified .. ..	—	2	—
AFRICANS—FEMALES			
Senile psychosis .. ..	1	—	—
Unclassified .. ..	—	1	—
TOTAL .. ..	2	13	1

GENERAL.

During the year forty male patients have been employed for three hundred days on foundation laying, road making, and arrangement of the surroundings of the new buildings including construction of fences. The Superintendent values this work in wages (at cents 50 per day per patient) at Sh. 6,000.

GENERAL STATISTICS.

The following table shows the number of admissions, discharges, and deaths for the past three years, 1931, 1932 and 1933.

				ADMISSIONS			DISCHARGES			DEATHS		
				1931	1932	1933	1931	1932	1933	1931	1932	1933
Males	..	..	..	80	37	27	55	36	12	23	8	5
Females	..	..	..	23	6	14	19	9	7	15	2	..
TOTALS	..	..	..	103	43	41	74	45	19	38	10	5



The total number of patients treated during the year was 153 :—

Males ... 111.                      Females ... 42.

The total number of patient days in hospital were :—

	1931	1932	1933
EUROPEAN—Male and Female	2,545	2,812	2,167
NATIVE—Male .. .. .	35,818	30,874	30,351
NATIVE—Female .. .. .	13,902	10,318	10,549
TOTALS .. .. .	54,196	44,004	43,067
The Average Daily Number was	124	121	117.99

Remaining at the end of year 1933— } .. .. Males .. 93  
128 Male and Female, all races } .. .. Females .. 35  
Remaining at the end of 1931 .. 124  
" " " " " 1932 .. 112

European Section.

The total number treated during 1933 was 13. The details are :—

	Males	Females
Remaining from 1932 ... ..	3	3
Admitted during 1933 ... ..	3	4
Discharged during 1933 ... ..	2	5
Deaths during 1933 ... ..	—	—
Remaining at end of 1933 ... ..	4	2

Total number of days' residence in hospital :—

Of those discharged ... ..	313
Of those died ... ..	—
Of those remaining ... ..	9,559
Total ... ..	9,872

Asian Section.

The total number treated during the year was 5. The details are :—

	Males	Females
Remaining from 1932 ... ..	2	2
Admitted during 1933 ... ..	1	—
Discharged during 1933 ... ..	—	—
Died during 1933 ... ..	1	—
Remaining at end of 1933 ... ..	2	2
Male Indian ... ..	2	
Female Indian ... ..	1	
Female Seychelle ... ..	1	
Total ... ..	4	

Total number of days' residence in hospital of :—

Those discharged during 1933 ... ..	Nil
Those remaining at end of 1933 ... ..	12,172
Those who died during 1933 ... ..	723
Total ... ..	12,895

African Section.

The total number treated during the year was 135. The details are :—

	<i>Males</i>	<i>Females</i>
Number treated during the year ...	102	33
Remaining from 1932 ...	79	23
Admitted during 1933 ...	23	10
Discharged during 1933 ...	11	2
Died during 1933 ...	4	—
...Remaining at end of 1933 ...	87	31

The total number of days of these were :—

Those discharged during 1933	4,096	1,494
Those remaining at end 1933	109,144	46,560
Those who died in 1933	629	—
<i>Totals</i>	113,869	48,054

Patients were admitted during the year from the following places :—

	<i>Males</i>	<i>Females</i>
Nairobi ...	13	4
Eldoret ...	2	1
Fort Hall ...	1	—
Kitale ...	1	—
Mombasa ...	4	3
Kiambu ...	2	—
Kabarnet ...	1	—
Kisumu ...	1	2
Kericho ...	1	—
Nakuru ...	—	3
Kakamega ...	—	1
<i>Totals ...</i>	26	14

MEDICAL WORK CARRIED OUT BY MISSIONARY SOCIETIES.

The number of hospital beds maintained by the Missionary Societies receiving medical grants from Government, the numbers of patients treated in these institutions, and the amounts of the grants given are shown in the following table :—

Mission	Place	No. of beds	In-patients	Out-patients	Out-dispensary patients	Con-fine-ments	Amount of grant
C.S.M. ...	Kikuyu ..	82	832	11,190	594	96	£ 450
„ ..	Chogoria ..	63	398	12,383	10,242	14	240
„ ..	Tumutumu ..	100	1,445	20,368	25,582	264	1,050
C.M.S. ...	Kaloleni ..	109	523	5,639	1,358	4	940
„ ..	Maseno ..	60	1,220	10,177	12,513	126	420
S.D.A. ...	Kendu ..	70	626	27,578	5,000 (approx.)	91	400

C.S.M.—Church of Scotland Mission.  
C.M.S.—Church Missionary Society.  
S.D.A.—Seventh Day Adventists.

At all the above mentioned hospitals a qualified medical practitioner and one or more European Nursing Sisters are employed.



## VII.—PRISONS AND ASYLUMS.

The vital statistics for the prisons of the Colony for 1933 and for the four preceding years are as follows :—

Year.	Daily Average in Prison.	Admissions to Hospital.	Daily Average on Sick List.	Percentage of Total Inmates.	Deaths.
1933	2,893	2,967	112	3·9	41
1932	2,642	1,882	93	3·5	33
1931	2,508	1,612	90	3·6	56
1930	2,380	1,729	95	4·0	29
1929	2,328	1,671	81	3·5	83

The forty-one deaths were from natural causes, and were due to the following diseases :—

	Nairobi Prison	All other Prisons	Total
Pneumonia .. .. .	8	11	19
Typhoid .. .. .	—	3	3
Dysentery, etc. .. .. .	1	1	2
Other Diseases .. .. .	3	14	17
TOTAL.. .. .	12	29	41

The death rate for all prisons was 14.1 per 1,000, and the morbidity rate 39 per 1,000. This death rate is rather lower than the rate for all prisoners in Uganda in 1932, where the rate for that year was 15.75, and compares favourably with that for the Tanganyika prisons, which in that year was 23.99. On the other hand, it compares somewhat unfavourably with that for the new Central Prison of Uganda for 1932 where the rate was 12 per 1,000. If, however, we take note of the fact that in the Central Prison of Uganda each prisoner had on an average 56 square feet of floor space then, having consideration of the fact that in Kenya prisoners have on an average only 25 square feet each of floor space, a death rate of 14.1 per thousand may not in the circumstances be unduly high.

The death rate in English convict prisons in 1931 was, however, only 8.2 per 1,000, and compared with this figure the Kenya rate is undoubtedly high. Of the 41 Kenya deaths 19 were attributable to pneumonia, and from an examination of the detailed returns furnished by the Commissioner of Prisons it appears that at least 15 of these 19 deaths occurred in prisoners who had been in all cases more than two months in prison, and in many cases several years. Most of these pneumonia deaths occurred, therefore, in prisoners who contracted their disease in prison and after a lapse of a sufficient period to exclude debility on admission as a predisposing cause.

Apart from debility, the conditions most likely to predispose to pneumonia are probably overcrowding, exposure, and a diet deficient in vitamin A.

In the Kenya prisons, almost without exception, the first of these conditions, namely overcrowding, prevails to a very serious degree, while the second, exposure, must often be unavoidable owing to the poor facilities which are offered by the prisons for the adoption of appropriate methods of care in connection with bathing, the drying of clothes, and general supervision.

That diet deficiency may occur is not improbable since, even if the standard ration issued be fully adequate as regards the accessory factors, it is always a matter of difficulty in the case of the smaller prisons to which trained European prison officers are not posted, to ensure that every detail of rationing and cooking receives that meticulous care which is necessary to ensure success, while even in the larger prisons the staff available for supervision is far from excessive.

For another reason, arising out of the weight records, the question of prison diets would appear to require investigation. Prisoners are weighed weekly, and the following is an analysis of the records of 5,932 prisoners in seven of the largest prisons during 1933 as given in the Prisons Report.

#### LONG TERM PRISONERS.

Increased in weight : an average of 7 lb. each	...	1,321
Decreased in weight : an average of 4.9 lb. each	...	1,021
No change	... ..	267
<i>Total prisoners</i>		<u>2,609</u>

Net gain : 1.6 lb. each.

#### SHORT TERM PRISONERS.

Increased in weight : an average of 4.8 lb. each	...	1,413
Decreased in weight : an average of 4.3 lb. each	...	931
No change	... ..	979
<i>Total prisoners</i>		<u>3,323</u>

Net gain : .8 lb. each.

The net average gains in the preceding four years were as follows :—

1933 ... Total 5,932 prisoners : Net gain 1.2 lb. each.

1932 ... Total 5,564 prisoners : Net gain 1.8 lb. each.

1931 ... Total 4,456 prisoners : Net gain 1½ lb. each.

1930 ... Total 4,674 prisoners : Net gain 1 lb. each.

Two points would appear to require investigation, namely, the reason for the drop in the net average gain in 1933, and the reason why so many prisoners show on an average such large decreases as 4.3 and 4.9 lb.

Important, however, as the question of diet always is the outstanding question in the case of the Kenya prisons at the present time is, undoubtedly, that of overcrowding. The accepted standard of accommodation in Kenya is 300 cubic feet, and 30 feet of floor space, per prisoner. On this basis there is accommodation in the Colony for 2,488 prisoners. On the other hand, the daily average in prisons during 1933 was 2,893. Even these figures, however, do not adequately represent the degree to which serious overcrowding occurs, as not only does the prison population at each prison vary from time to time, but some prisons are much more inadequate for the purposes of the districts which they serve than others.

In 1932, when the demands made on the prisons was less than in 1933, the floor space available per prisoner was in some cases as low as 10 square feet; in that year out of twenty prisons an average of 30 square feet of floor space was available in only five, while in five the floor space available was less than 20 square feet, and of these four provided only 15, 14, 11, and 10 square feet, respectively.

In many detention camps the position as regards overcrowding was equally, or even more, serious, while the standard of construction in many of these camps is very far from satisfactory.

#### LUNATICS.

During the year a total of 236 persons were admitted to those of the prisons which are gazetted as lunatic asylums, either for observation, or on certification. As far as possible lunatics were transferred thereafter to the Mental Hospital, but the accommodation at that institution is so limited that



as a rule there were from thirty to forty lunatics confined in prisons, some being detained for long periods before they could be transferred. The arrangement is a highly unsatisfactory one, and it is a matter of urgency that alternative accommodation should be provided.

#### SANITATION.

The general sanitary condition of the prisons is, if regard be had to the general lack of accommodation and convenience, exceedingly good, and reflects the greatest credit on the prison staff and authorities.

#### MEDICAL.

Owing to the general shortage of medical staff it has never yet been possible to give that amount of special attention to the medical problems presented by the prison community which they deserve.

From the preceding notes it will be observed that there are undoubtedly problems connected with the ordinary physical health of prisoners which would repay attention. There is, however, also one particular problem which has not hitherto received attention which is of particular importance, namely, the medical aspects of delinquency, both in adults and juveniles. This matter, in view of the fact that important changes in the matter of accommodation cannot be long delayed, and for other reasons, is now one of more than ordinary urgency and importance.

### VIII.—METEOROLOGY.

The statistics supplied by the Director of the British East African Meteorological Service are contained in Table IV appended to this Report.

A. R. PATERSON,  
*Director of Medical Services.*

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**RETURNS.****TABLE I.**

## MEDICAL STAFF.

J. L. GILKS, Director of Medical and Sanitary Services.						
A. D. J. B. WILLIAMS, Deputy Director of Medical Service.						
A. R. Paterson, Deputy Director of Sanitary Services.						
Senior Medical Officers	...	...	...	...	...	5
Senior Health Officers	...	...	...	...	...	2
Medical Officers	...	...	...	...	...	36
Health Officers	...	...	...	...	...	4
Matron	...	...	...	...	...	1
Nursing Sisters and Health Visitors	...	...	...	...	...	42
Sanitary Inspectors	...	...	...	...	...	13
Assistant Surgeons : European	...	...	...	...	...	2
Assistant Surgeons : Asiatic	...	...	...	...	...	1
Sub-Assistant Surgeons	...	...	...	...	...	28

## PRINCIPAL CHANGES.

(1) A. R. PATERSON to be Director of Medical and Sanitary Services on the retirement of J. L. GILKS, 3rd November, 1933.

(2) W. K. KAUNTZE to be Director of Medical and Sanitary Services, Uganda, 9th March, 1933.

(3) F. J. C. JOHNSTONE to be Deputy Director of Medical Service from 5th September, 1933, *vice* A. B. WILLIAMS transferred to Nyasaland on promotion to Director of Medical and Sanitary Services.

*Resignations—*

Medical Officers, 2; Nursing Sisters, 2.

*Appointments terminated—*

Senior Health Officer, 1; Nursing Sister, 1.

**TABLE II.****Financial.**

The sanctioned Medical Budget for the year 1933 was a total of £215,166, as compared with £219,757 for the preceding twelve months.

The headings under which the vote was arranged were as follows :—

## MEDICAL DEPARTMENT.

				<i>Actual</i>
		<i>Estimates</i>		<i>Expenditure</i>
		£		£
<i>Administrative Division.</i>				
Personal Emoluments	...	10,175	...	10,246
<i>Medical Division.</i>				
Personal Emoluments	...	30,985	...	30,537
<i>Sanitation Division.</i>				
Personal Emoluments	...	11,169	...	12,049
<i>Laboratory Division.</i>				
Personal Emoluments	...	13,007	...	12,339
Other Charges	...	34,736	...	93,484
		<hr/>		<hr/>
		£100,072		£93,484
		<hr/>		<hr/>



			<i>Estimates</i>		<i>Actual</i>
			£		£
NATIVE SERVICES.					
Personal Emoluments	...	...	69,292	...	64,541
Other Charges	...	...	45,752	...	41,543
			<hr/>		<hr/>
			£115,044		£106,084
			<hr/>		<hr/>
<i>Extraordinary Expenditure</i>	...	...	£50		£50
The total amount of revenue collected was as follows :—					
Hospital fees	...	...	...	...	£7,096
Bills of Health	...	...	...	...	763
Infectious Diseases Hospital, Fees, Nairobi Municipality	...	...	...	...	453
Infectious Diseases Hospital, Fees, Mombasa Municipality	...	...	...	...	225
Fees from Medical Research Laboratory	...	...	...	...	1,510
Fees from Government Analyst	...	...	...	...	29
Registration Fees	...	...	...	...	67
Sale of Medicine, etc.	...	...	...	...	1,424
Hire of Government Motor Vehicles (Ambulances)					33
					<hr/>
					£11,600
Re-imbursement from Uganda Government on account of Zanzibar Sanitary Station	...	...	...	...	425
Reimbursement from Kenya and Uganda Railways and Harbours on account of Medical Services					5,073
Reimbursement on account of messing expenses, European Hospital, Nairobi	...	...	...	...	499
					<hr/>
					£5,997
					<hr/>
					£17,597
					<hr/>

Last year the total revenue collected amounted to £18,748.

TABLE III.  
Return of Statistics of Population for the Year 1933.

COLONY AND PROTECTORATE OF KENYA	Europeans and Whites	Africans and Others	Asiatics
Number of Inhabitants in 1931 .. ..	*16,812	African: 3 007 645† Arabs and others 17 491‡	39 644‡
Number of Births Registered in 1933 .. ..	315	52	367
Number of Deaths Registered in 1933 .. ..	109	995	420
Number of Immigrants during 1933 .. ..	4,623	1,805	6 454
Number of Emigrants during 1933 .. ..	4,643	1,690	8,152
Number of Inhabitants during 1933 .. ..	No figures available beyond 1931 Census	3,017,117	No figures available beyond 1931 Census

\* 1931 Census.  
† Estimated at 31-12-1932.  
‡ 1931 Census.

TABLE IV.  
Meteorological Return for the Year 1933.

MONTH.	TEMPERATURE			RAINFALL		WINDS	
	Shade Max. (Mean)	Max. and Min. (mean)	Shade Minimum (Mean)	Amount Rain Inches	Humidity.	GEN. Dir. 8.30 a.m.	Force 1-10 8.30 a.m.
MOMBASA OBSERVATORY							
January .. ..	86·7	75·8	81·3	5·59	81%	N by W	1·5
February .. ..	90·5	76·7	83·6	0·25	74	NW by N	1·5
March .. ..	92·0	78·1	85·1	0·95	72	S by W	2·1
April .. ..	92·1	78·2	85·1	2·81	73	SSW	2·0
May .. ..	86·4	75·5	80·9	4·92	79	S by W	2·0
June .. ..	84·6	73·2	78·9	3·31	77	S by W	1·4
July .. ..	82·6	71·8	77·2	4·00	81	S by W	2·1
August .. ..	83·5	71·4	77·4	3·69	77	S by E	2·7
September .. ..	83·6	71·7	77·7	2·75	79	S by E	2·8
October .. ..	87·5	73·7	80·6	0·60	72	SE by E	2·6
November .. ..	88·4	75·3	81·8	5·70	77	SSE	1·7
December .. ..	88·5	76·0	82·3	6·05	76	NNW	2·5
YEAR AVERAGE ..	87·2	74·8	81·0	40·62	77	S	2·1
KISUMU, MARINE DEPARTMENT							
January .. ..	82·6	74·1	65·6	4·24	66%	SE	2·6
February .. ..	81·9	73·3	64·6	1·81	68	SE by E	2·3
March .. ..	82·5	73·7	64·9	4·38	64	ESE	2·4
April .. ..	84·2	74·8	65·5	5·09	66	SE by E	2·5
May .. ..	82·3	73·7	65·1	3·50	74	SE by E	2·3
June .. ..	84·6	73·9	63·2	1·66	65	SE by E	2·5
July .. ..	82·4	72·5	62·6	3·08	71	SE by E	2·4
August .. ..	82·7	72·6	62·6	6·41	74	SE by E	2·2
September .. ..	84·3	73·3	62·2	4·49	70	SE by S	2·4
October .. ..	95·8	74·7	63·7	2·33	64	SSE	2·0
November .. ..	85·4	74·5	63·5	2·14	63	S	2·2
December .. ..	82·5	72·9	63·3	1·79	63	SE by E	2·6
YEAR AVERAGE ..	83·4	73·7	63·9	40·92	67	SE by E	2·4



METEOROLOGICAL RETURNS—Contd.

MONTH	TEMPERATURE			RAINFALL		WINDS	
	Shade Max. (mean)	Max. and Min. (mean)	Shade Minimum (mean)	Amount Rain Inches	Humidity	GEN. Dir. 8.30 a.m.	Force 1-10 8.30 a.m.
KABETE OBSERVATORY							
January .. ..	71.2	63.3	55.4	4.79	84%	ENE	3.1
February .. ..	77.3	65.8	54.4	0.02	71	NE	2.4
March .. ..	79.9	67.4	55.0	0.57	73	ENE	2.6
April .. ..	78.3	67.9	57.4	2.36	78	E by S	2.2
May .. ..	75.1	65.2	55.3	3.22	81	SE by E	1.6
June .. ..	74.7	63.1	51.4	0.31	79	E	2.1
July .. ..	69.1	60.6	52.1	0.64	87	SE by E	1.6
August .. ..	70.2	60.4	50.7	2.11	85	SE	1.6
September .. ..	71.3	61.7	52.0	0.32	83	E by S	1.7
October .. ..	75.2	64.0	52.8	2.18	79	ENE	2.3
November .. ..	72.1	63.7	55.2	4.84	85	ENE	2.7
December .. ..	71.7	62.9	54.1	3.07	81	ENE	2.4
YEAR AVERAGE ..	73.8	62.8	53.8	24.43	80	E by N	2.2
NAIROBI, K.U.R.							
January .. ..	75.7	66.3	56.8	4.96	83	E	1.9
February .. ..	82.4	68.2	54.1	0.00	70	E by N	1.4
March .. ..	85.2	70.7	56.1	1.09	72	E	1.5
April .. ..	83.3	71.4	59.5	1.42	77	E by N	1.5
May .. ..	80.0	68.9	56.9	1.94	78	E by S	1.3
June .. ..	78.4	65.5	52.7	0.45	72	ESE	2.1
July .. ..	72.3	63.5	54.6	0.76	82	ESE	1.5
August .. ..	74.0	63.4	52.8	1.49	84	SE	1.4
September .. ..	74.2	64.6	55.1	0.08	79	E by S	1.6
October .. ..	77.9	66.8	55.7	2.72	78	E	2.4
November .. ..	75.5	66.7	57.9	3.53	82	ENE	2.3
December .. ..	75.1	66.1	57.2	2.89	79	ENE	2.3
YEAR AVERAGE ..	77.8	66.8	55.8	21.33	78	E	1.8

N.B.—There are no records available for solar maximum and maximum on grass.

TABLE SHOWING ANNUAL RAINFALL RECORDED AT VARIOUS POINTS IN THE DIFFERENT AREAS FOR THE YEAR 1933.

COAST AREA.			MOUNTAINOUS AREA—(Contd.).		
STATION.	1933.		STATION	1933.	
	Rainfall in			Rainfall in	
Malindi, D.C. ..	31.94	inches	Nakuru, K.U.R... ..	26.22	inches
Mombasa Observatory	40.62	„	Molo, K.U.R. .. ..	33.55	„
Mazeras, K.U.R. ..	17.83	„	Eldama Ravine, Post Office	30.87	„
Mackinnon Road, K.U.R.	39.60	„			
Voi, K.U.R. .. ..	15.77	„	NYANZA AND KENYA PROVINCE.		
Taveira, Col. Homer	16.84	„		Rainfall in	
			Lumbwa, K.U.R. .. ..	28.62	inches
MOUNTAINOUS AREA.			Muhuroni, K.U.R. .. ..	46.85	„
	Rainfall in		Kisumu, Marine Depart-		
Masongaleni, K.U.R. ..	26.35	inches	ment .. ..	40.92	„
Makindu, K.U.R. ..	20.06	„	Mumias, Kakamega D.C.	66.80	„
Athi River, K.U.R. ..	17.79	„	Kericho, D.C. .. ..	64.45	„
Kiu, K.U.R. .. ..	18.25	„	Nandi, Kipkarron Est. ..	45.00	„
Nairobi, K.U.R. ..	21.33	„	Fort Hall, D.C. .. ..	34.86	„
Kabete Reformatory,			Nyeri, D.C. .. ..	33.80	„
(Near Nairobi) ..	28.64	„	West Kenya, “Karameno,”		
Naivasha, K.U.R. ..	20.99	„	(Naro Moru) .. ..	25.33	„

TABLE V.  
COLONY AND PROTECTORATE OF KENYA  
RETURN OF DISEASES (In-Patients)  
*For the Year 1933*

DISEASES	EUROPEAN OFFICIALS				EUROPEAN GENERAL POPULATION (Non-Official)				Non-EUROPEAN OFFICIALS (including ASIATICS)				NATIVE GENERAL POPULATION (including ASIATICS)			
	Cases remaining in Hospital from previous year	Total Admis- sion	Total Deaths	Total Cases Treated	Remaining in Hospital at end of year	Cases remaining in Hospital from previous year	Total Admis- sion	Total Deaths	Total Cases Treated	Remaining in Hospital at end of year	Cases remaining in Hospital from previous year	Total Admis- sion	Total Deaths	Total Cases Treated	Remaining in Hospital at end of year	
I.—EPIDEMIC, ENDEMIC AND INFECTIOUS DISEASES.																
1. Enteric Group—																
(a) Typhoid Fever	..	2	..	2	..	2	9	..	11	1	1	70	14	81	3	
(b) Paratyphoid A.	..	2	..	2	..	..	5	..	5	..	1	1	..	2	..	
(c) Paratyphoid B.	..	1	..	1	..	..	2	..	2	..	..	3	..	3	..	
(d) Type not defined	..	1	..	1	1	..	2	..	2	..	..	5	2	5	..	
T. A. B. reaction	..	..	..	..	..	..	..	..	..	..	..	6	..	6	..	
2. Typhus	..	3	..	3	..	..	1	..	1	..	..	1	..	1	..	
3. Relapsing Fever	..	..	..	..	..	..	..	..	..	..	5	141	1	146	..	
4. Undulant Fever	..	..	..	..	..	..	..	..	..	..	..	6	1	6	..	
5. Malaria—Clinical	..	60	..	62	1	..	67	..	67	2	12	1,191	10	1,203	42	
(a) Tertian	2	15	..	16	..	..	1	..	1	..	..	298	17	298	1	
(b) Quartan	1	12	..	13	..	..	9	..	9	1	8	215	2	223	4	
(c) Aestivo-autumnal	3	79	..	82	..	2	119	1	121	2	24	1,646	48	1,670	31	
(d) Undifferentiated	..	5	..	5	..	..	3	..	3	..	5	50	1	55	..	
(e) Cachexia	..	..	..	..	..	..	2	..	2	1	..	26	1	26	2	
(f) Blackwater	..	..	..	..	..	..	..	..	..	..	..	15	7	15	..	
Cerebral	..	..	..	..	..	..	..	..	..	..	..	1	..	1	..	
6. Smallpox	..	..	..	..	..	..	..	..	..	..	..	3	..	3	..	
Alastrim	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	
7. Measles	..	1	..	1	..	..	5	..	5	..	..	284	4	287	16	
8. Scarlet Fever	..	..	..	..	..	..	1	..	1	..	..	..	..	..	..	
9. Whooping Cough	..	..	..	..	..	..	3	..	3	..	..	146	11	146	7	
10. Diphtheria..	..	..	..	..	..	..	..	..	..	..	..	6	..	6	1	
11. Influenza	1	134	..	135	..	1	51	..	52	10	13	539	1	552	25	
12. Military Fever	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	
13. Mumps	..	..	..	..	..	..	..	..	..	..	..	46	..	46	3	
14. Cholera	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	
15. Epidemic Diarrhoea	..	..	..	..	..	..	..	..	..	..	..	2	1	2	..	
16. Dysentery—	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	
(a) Amoebic	1	33	..	34	1	1	44	..	45	..	5	412	23	417	16	
(b) Bacillary	..	1	..	1	..	..	10	..	10	..	1	112	10	113	7	
(c) Undefined or due to other causes	..	12	..	12	1	..	8	..	8	..	4	319	8	323	6	



RETURN OF DISEASES—IN-PATIENTS—(Contd.)

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64

DISEASES	EUROPEAN OFFICIALS				EUROPEAN GENERAL POPULATION (NON-OFFICIAL)				NON-EUROPEAN OFFICIALS (including ASIATICS)				NATIVE GENERAL POPULATION (including ASIATICS)			
	Cases remaining in Hospital from previous year	Total Admis- sion	Total Deaths	Total Cases Treated	Remaining in Hospital at end of year	Cases remaining in Hospital from previous year	Total Admis- sion	Total Deaths	Total Cases Treated	Remaining in Hospital at end of year	Cases remaining in Hospital from previous year	Total Admis- sion	Total Deaths	Total Cases Treated	Remaining in Hospital at end of year	
I.—EPIDEMIC, ENDEMIC AND INFECTIOUS DISEASES—(Contd.).																
17. Plague—																
(a) Bubonic ..	..	..	..	..	..	..	..	..	..	..	..	10	4	10	..	..
(b) Pneumonic ..	..	..	..	..	..	..	..	..	..	..	..	3	..	3	..	..
(c) Septicæmic ..	..	..	..	..	..	..	..	..	..	..	..	1	..	1	..	..
(d) Undefined ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
18. Yellow Fever ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
19. Spirochaetosis ictero-hæmorrhagica ..	..	..	..	..	..	..	1	..	..	..	..	47	8	177	114	..
20. Leprosy ..	..	..	..	..	..	..	2	..	..	..	..	5	..	5	..	..
21. Erysipelas ..	..	..	..	..	..	..	..	..	..	..	..	2	..	2	..	..
22. Acute Poliomyelitis ..	..	..	..	..	..	..	..	..	..	..	..	3	1	3	..	..
23. Encephalitis Lethargica ..	..	..	..	..	..	..	..	..	..	..	..	22	14	22	..	..
24. Epidemic Cerebro-spinal Fever..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
25. Other Epidemic Diseases—																
(a) Rubella (German Measles)	..	..	..	..	..	..	..	..	..	..	..	1	..	1	..	..
(b) Varicella (Chicken-pox) ..	..	..	..	..	..	..	..	..	..	..	..	535	..	537	25	..
(c) Kala-azar ..	..	..	..	..	..	..	..	..	..	..	..	1	..	1	..	..
(d) Phlebotomus Fever ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
(e) Dengue ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
(f) Epidemic Dropsy ..	..	..	..	..	..	..	..	..	..	..	..	807	7	871	46	..
(g) Yaws ..	..	..	..	..	..	..	..	..	..	..	..	26	1	28	2	..
(h) Trypanosomiasis ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
26. Glanders ..	..	..	..	..	..	..	..	..	..	..	..	1	..	1	1	..
27. Anthrax ..	..	..	..	..	..	..	..	..	..	..	..	56	5	57	3	..
28. Rabies ..	..	..	..	..	..	..	..	..	..	..	..	4	..	4	4	..
29. Tetanus ..	..	..	..	..	..	..	..	..	..	..	..	24	16	26	1	..
30. Mycosis ..	..	..	..	..	..	..	..	..	..	..	..	1	..	1	1	..
31. Tuberculosis, Pulmonary and Laryngeal ..	..	1	..	1	..	..	5	1	1	..	..	426	107	472	53	..
32. Tuberculosis of the Meninges or Central Nervous System ..	..	..	..	..	..	..	..	..	..	..	..	2	2	2	1	..
33. Tuberculosis of the Intestines or Peritoneum ..	..	1	..	1	..	..	..	..	..	..	..	17	10	17	..	..

RETURN OF DISEASES—IN-PATIENTS—(Contd.).

DISEASES	EUROPEAN OFFICIALS				EUROPEAN GENERAL POPULATION (Non-Official)				NON-EUROPEAN OFFICIALS (including ASIATICS)				NATIVE GENERAL POPULATION (including ASIATICS)			
	Cases remaining in Hospital from previous year	Total Admis- sion	Total Deaths	Total Cases Treated	Remaining in Hospital at end of year	Cases remaining in Hospital from previous year	Total Admis- sion	Total Deaths	Total Cases Treated	Remaining in Hospital at end of year	Cases remaining in Hospital from previous year	Total Admis- sion	Total Deaths	Total Cases Treated	Remaining in Hospital at end of year	
I.—EPIDEMIC, ENDEMIC AND INFECTIOUS DISEASES—(Contd.).																
34. Tuberculosis of the Vertebral Column .. .. .	..	..	..	..	..	..	..	..	..	..	2	12	3	14	2	
35. Tuberculosis of Bones and Joints .. .. .	..	..	..	..	..	..	..	..	..	..	9	52	4	61	10	
36. Tuberculosis of other Organs— (a) Skin or Subcutaneous Tissue (Lupus) .. .. .	..	..	..	..	..	..	..	..	..	..	..	8	1	8	1	
(b) Bones .. .. .	..	..	..	..	..	..	..	..	..	..	..	12	..	12	1	
(c) Lymphatic System .. .. .	..	..	..	..	..	..	..	..	..	..	6	99	8	105	11	
(d) Genito-urinary .. .. .	..	..	..	..	..	..	..	..	..	..	1	1	1	2	..	
(e) Other Organs .. .. .	..	1	..	1	..	..	..	..	..	..	2	12	2	14	..	
37. Tuberculosis disseminated— (a) Acute .. .. .	..	..	..	..	..	..	..	..	..	..	2	2	1	4	..	
(b) Chronic .. .. .	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	
38. Syphilis—Condyloma .. .. .	..	..	..	..	..	..	..	..	..	..	..	2	..	2	..	
(a) Primary .. .. .	..	..	..	..	..	..	..	..	..	..	21	782	2	803	53	
(b) Secondary .. .. .	..	..	..	..	..	..	..	..	..	..	21	348	4	369	14	
(c) Tertiary .. .. .	..	..	..	1	..	..	..	..	..	..	8	113	5	121	3	
(d) Hereditary .. .. .	..	..	..	..	..	..	..	..	..	..	8	84	19	92	3	
(e) Period not indicated .. .. .	..	..	..	..	..	..	..	..	..	..	14	204	3	218	20	
Pyæmia .. .. .	..	..	..	..	..	..	..	..	..	..	..	3	1	3	..	
39. Soft Chancre .. .. .	..	..	..	..	..	..	..	..	..	..	2	23	..	25	2	
40. A.—Gonorrhœa and its compli- cations .. .. .	..	2	..	2	..	..	3	..	2	..	47	784	3	831	47	
B.—Gonorrhœal Ophthalmia .. .. .	..	..	..	..	..	..	..	..	..	..	4	10	..	14	..	
C.—Gonorrhœal Arthritis .. .. .	..	..	..	..	..	..	..	..	..	..	..	11	..	11	1	
D.—Granuloma Venereum .. .. .	..	..	..	..	..	..	1	..	..	..	..	4	..	4	..	
41. Septicæmia .. .. .	1	1	..	2	..	..	..	..	..	..	..	29	24	29	..	
42. Other Infectious Diseases .. .. .	..	..	..	..	..	..	..	..	..	..	..	1	..	1	..	
II.—GENERAL DISEASES NOT MENTIONED ABOVE.																
43. Cancer or other Malignant Tu- mours of the Buccal Cavity .. .. .	..	..	..	..	..	..	..	..	..	..	..	10	2	10	..	
44. Cancer or other Malignant Tu- mours of the Stomach or Liver .. .. .	..	1	..	1	..	..	..	..	..	..	..	21	10	21	1	



## RETURN OF DISEASES—IN-PATIENTS—(Contd.).

DISEASES	EUROPEAN OFFICIALS					EUROPEAN GENERAL POPULATION (NON-OFFICIAL)					NON-EUROPEAN OFFICIALS (including ASIATICS)					NATIVE GENERAL POPULATION (including ASIATICS)				
	Cases remaining in Hospital from previous year	Total Admis- sion	Total Deaths	Total Cases Treated	Remaining in Hospital at end of year	Cases remaining in Hospital from previous year	Total Admis- sion	Total Deaths	Total Cases Treated	Remaining in Hospital at end of year	Cases remaining in Hospital from previous year	Total Admis- sion	Total Deaths	Total Cases Treated	Remaining in Hospital at end of year	Cases remaining in Hospital from previous year	Total Admis- sion	Total Deaths	Total Cases Treated	Remaining in Hospital at end of year
II.—GENERAL DISEASES NOT MENTIONED ABOVE—(Contd.).																				
45. Cancer or other Malignant Tu- mours of the Peritoneum In- testines, Rectum .. .. .	..	..	..	..	..	..	3	1	3	..	..	..	..	..	..	1	12	3	13	..
46. Cancer or other Malignant Tu- mours of the Female Genital Organs .. .. .	..	1	..	1	..	..	..	..	..	..	..	..	..	..	..	..	6	1	6	..
47. Cancer or other Malignant Tu- mours of the Breast .. .. .	..	..	..	..	..	..	2	1	2	..	..	..	..	..	..	..	7	1	7	..
48. Cancer or other Malignant Tu- mours of the Skin .. .. .	..	..	..	..	..	..	1	..	1	..	..	..	..	..	..	1	9	..	10	..
49. Cancer or other Malignant Tu- mours of Organs not specified..	..	..	..	..	..	..	2	..	2	..	..	..	..	..	..	4	46	11	50	1
50. Tumours, Non-malignant .. .. .	..	4	..	4	..	1	6	..	7	..	..	..	..	..	..	11	196	3	207	8
51. Acute Rheumatism .. .. .	..	6	..	6	..	..	4	..	4	..	..	26	..	26	1	2	96	..	98	2
52. Chronic Rheumatism .. .. .	..	2	..	2	..	..	2	..	2	..	..	27	..	27	2	3	245	..	248	9
Rheumatic Fever.. .. .	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	1	..
53. Scurvy (including Barlow's Dis- ease) .. .. .	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	15	1	16	1
54. Pellagra .. .. .	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
55. Beri-beri .. .. .	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	..	2	..
56. Rickets .. .. .	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	5	..	5	1
57. Diabetes (not including Insipidus)	..	..	..	..	..	..	..	..	..	..	..	2	..	2	..	..	16	3	16	1
58. Anaemia-- (a) Pernicious .. .. . (b) Other Anaemias and Chlér- osis .. .. .	..	9	..	9	..	..	..	..	..	..	..	..	..	..	..	..	6	2	6	..
59. Diseases of the Pituitary Body..	..	..	..	..	..	..	..	..	1	..	..	7	..	7	..	3	75	15	78	3
60. Diseases of the Thyroid Gland-- (a) Exophthalmic Goitre .. .. . (b) Other Diseases of the Thy- roid Gland, Myxoedema ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	1	..
61. Diseases of the Para-thyroid Glands .. .. .	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	6	..	8	1
62. Diseases of the Thymus .. .. .	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	3	..	3	..
	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..

RETURN OF DISEASES—IN-PATIENTS—(Contd.).

DISEASES	EUROPEAN OFFICIALS				EUROPEAN GENERAL POPULATION (NON-OFFICIAL)				NON-EUROPEAN OFFICIALS (including ASIATICS)				NATIVE GENERAL POPULATION (including ASIATICS)			
	Cases remaining in Hospital from previous year	Total Admis- sion	Total Deaths	Total Cases Treated	Remaining in Hospital at end of year	Cases remaining in Hospital from previous year	Total Admis- sion	Total Deaths	Total Cases Treated	Remaining in Hospital at end of year	Cases remaining in Hospital from previous year	Total Admis- sion	Total Deaths	Total Cases Treated	Remaining in Hospital at end of year	
II.—GENERAL DISEASES NOT MENTIONED ABOVE—(Contd.).																
63. Diseases of the Supra-renal Glands .. ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
64. Diseases of the Spleen ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
65. Leukæmia—	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
(a) Leukæmia .. ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
(b) Hodgkin's Disease..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
66. Alcoholism .. ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
67. Chronic poisoning by mineral substances (Lead, Mercury, etc.)	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
68. Chronic poisoning by organic substances (Morphia, Cocaine, etc.) .. ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
69. Other General Diseases—	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Auto-intoxication ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Purpura Hæmorrhagica..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Hæmophilia .. ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Diabetes Insipidus ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
III.—AFFECTIONS OF THE NERVOUS SYSTEM AND ORGANS OF THE SENSES.																
70. Encephalitis (not including Encephalitis Lethargica) ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
71. Meningitis (not including Tuberculous Meningitis or Cerebro-spinal Meningitis) ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Parkinson's Disease ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
72. Locomotor Ataxia .. ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
73. Other affections of the Spinal Cord	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
74. Apoplexy—	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
(a) Hæmorrhage .. ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
(b) Embolism .. ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
(c) Thrombosis .. ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..



RETURN OF DISEASES—IN-PATIENTS—(Contd.).

M E D

63

DISEASES	EUROPEAN OFFICIALS				EUROPEAN GENERAL POPULATION (NON-OFFICIAL)				NON-EUROPEAN OFFICIALS (including ASIATICS)				NATIVE GENERAL POPULATION (including ASIATICS)			
	Cases remaining in Hospital from previous year	Total Admis- sion	Total Deaths	Total Cases Treated	Remaining in Hospital at end of year	Cases remaining in Hospital from previous year	Total Admis- sion	Total Deaths	Total Cases Treated	Cases remaining in Hospital from previous year	Total Admis- sion	Total Deaths	Total Cases Treated	Cases remaining in Hospital from previous year	Total Admis- sion	Total Deaths
III.—AFFECTIONS OF THE NERVOUS SYSTEM AND ORGANS OF THE SENSES—(Contd.).																
75. Paralysis— (a) Hemiplegia .. .. .	..	2	1	2	..	..	1	..	..	..	23	5	24	1	23	5
(b) Other Paralysis .. ..	..	..	..	..	..	..	..	..	..	5	38	..	43	5	38	..
76. General Paralysis of the Insane ..	..	1	..	1	..	5	6	..	..	..	2	..	2	..	2	..
77. Other forms of Mental Alienation	..	..	..	..	..	1	1	..	..	108	79	5	187	128	79	5
78. Epilepsy .. .. .	..	..	..	..	..	1	..	..	..	2	60	4	62	5	60	4
79. Eclampsia   Convulsions (non- puerperal) 5 years or over ..	..	3	..	3	..	..	3	..	..	..	1	..	1	..	1	..
Concussion .. .. .	..	..	..	..	..	..	1	..	1	..	6	2	7	..	6	2
80. Infantile Convulsions .. .. .	..	..	..	..	..	..	..	..	..	..	6	..	6	..	6	..
81. Chorea .. .. .	..	..	..	..	..	..	..	..	..	..	2	2	..	..	2	2
Tetany .. .. .	..	..	..	..	..	..	..	..	..	..	6	..	6	..	6	..
Sciatica .. .. .	..	..	..	..	..	..	..	..	..	..	14	..	15	..	14	..
82. A.—Hysteria .. .. .	..	2	..	2	..	..	..	2	2	1	35	..	39	4	35	..
B.—Neuritis .. .. .	..	9	..	9	..	6	6	..	2	..	11	..	11	..	11	..
C.—Neurasthenia .. .. .	..	8	..	8	..	2	2	..	22	..	44	..	44	..	44	..
Neuralgia .. .. .	..	..	..	..	..	..	..	..	..	..	1	1	1	..	1	1
83. Cerebral Abscess .. .. .	..	..	..	..	..	..	..	..	..	..	3	..	3	..	3	..
Headache .. .. .	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
84. Other affections of the Nervous System, such as Paralysis	..	..	..	..	..	..	..	..	..	..	27	..	29	2	27	..
Agitans .. .. .	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..
85. Affections of the Organs of Vision	..	9	..	9	..	..	3	..	..	..	396	..	409	13	396	..
(a) Conjunctivitis .. .. .	..	..	..	..	..	..	..	..	7	..	33	..	34	1	33	..
(b) Trachoma .. .. .	..	..	..	..	..	..	..	..	..	..	6	..	8	2	6	..
(c) Tumours of the Eye .. ..	..	..	..	..	..	..	..	..	..	..	248	..	255	7	248	..
Cataract .. .. .	..	4	..	4	..	..	5	..	30	..	..	..	..	..	..	..
(d) Other affections of the Eye	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
86. Affections of the Ear or Mastoid	..	5	..	5	..	..	8	..	8	..	126	1	131	5	126	1
Sinus .. .. .	..	..	..	..	..	..	..	..	..	..	6	..	7	1	6	..
Concussion .. .. .	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
IV.—AFFECTIONS OF THE CIRCULATORY SYSTEM.																
87. Pericarditis .. .. .	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
88. Acute Endocarditis or Myocar- ditis .. .. .	..	1	..	1	..	..	..	..	1	..	7	1	7	..	7	1
89. Angina Pectoris .. .. .	..	1	..	1	..	..	..	..	..	..	1	..	1	..	1	..

RETURN OF DISEASES—IN-PATIENTS—(Contd.).

DISEASES	EUROPEAN OFFICIALS				EUROPEAN GENERAL POPULATION (NON-OFFICIAL)				NON-EUROPEAN OFFICIALS (including ASIATICS)				NATIVE GENERAL POPULATION (including ASIATICS)			
	Cases remaining in Hospital from previous year	Total Admis- sion	Total Deaths	Total Cases Treated	Remaining in Hospital at end of year	Cases remaining in Hospital from previous year	Total Admis- sion	Total Deaths	Total Cases Treated	Remaining in Hospital at end of year	Cases remaining in Hospital from previous year	Total Admis- sion	Total Deaths	Total Cases Treated	Remaining in Hospital at end of year	
IV.—AFFECTIONS OF THE CIRCULATORY SYSTEM—(Contd.).																
90. Other Diseases of the Heart—																
(a) Valvular—																
Mitral ..	..	3	..	3	..	1	1	1	1	..	..	3	3	10	..	1
Aortic ..	..	..	..	..	..	1	..	..	1	..	..	20	14	21	..	..
Tricuspid ..	..	..	..	..	..	3	..	..	..	..	..	46	14	46	..	..
Pulmonary ..	..	..	..	..	..	..	..	..	..	..	..	6	3	6	..	..
(b) Myocarditis ..	1	..	..	1	..	1	..	..	..	..	1	11	..	..	..	..
91. Diseases of the Arteries—																
(a) Aneurism ..	..	1	..	1	..	..	..	..	..	..	..	2	..	2	..	..
(b) Arterio-sclerosis ..	..	..	..	..	..	1	..	..	1	..	..	1	1	1	..	..
(c) Other Diseases ..	..	..	..	..	..	..	..	..	..	..	..	3	..	3	..	..
92. Embolism or Thrombosis (non-cerebral) ..	..	1	..	1	..	..	..	..	..	..	..	..	..	..	..	..
93. Diseases of the Veins—																
Hæmorrhoids ..	..	7	..	7	..	6	..	..	6	..	..	3	..	3	..	1
Varicose Veins ..	..	..	..	..	..	..	..	..	..	..	..	18	..	18	..	..
Phlebitis ..	..	..	..	..	..	1	..	..	1	..	1	7	..	8	..	..
94. Diseases of the Lymphatic System—																
Lymphangitis ..	..	2	..	2	..	5	..	..	5	..	..	6	..	6	1	1
Lymphadenitis, Bubo (non-specific) ..	..	1	..	1	..	2	..	..	2	..	..	33	..	35	2	2
Adenitis ..	..	1	..	1	..	2	..	..	1	..	11	147	1	158	12	12
95. Hæmorrhage of undetermined cause ..	..	..	..	..	..	1	1	1	1	..	..	1	..	..	..	..
96. Other affections of the Circulatory System ..	..	..	..	..	..	5	..	..	5	..	..	13	1	13	2	2
V.—AFFECTIONS OF THE RESPIRATORY SYSTEM.																
97. Diseases of the Nasal Passages—																
Adenoids ..	..	7	..	7	..	5	..	1	5	..	..	4	..	4	1	1
Sinusitis ..	..	..	..	..	..	3	..	..	3	..	..	..	..	..	..	..
Polypus ..	..	1	..	1	..	..	..	..	..	..	..	9	..	9	1	1
Rhinitis ..	..	1	..	1	..	..	..	..	6	..	..	5	..	5	1	1
Coryza ..	..	10	..	10	..	7	..	..	18	..	..	40	..	40	..	..
Epistaxis ..	..	..	..	..	..	..	..	..	..	..	..	1	..	1	..	..



DISEASES	EUROPEAN OFFICIALS					EUROPEAN GENERAL POPULATION (NON-OFFICIAL)					NON-EUROPEAN OFFICIALS (including ASIATICS)					NATIVE GENERAL POPULATION (including ASIATICS)				
	Cases remaining in Hospital from previous year	Total Admis- sion	Total Deaths	Total Cases Treated	Remaining in Hospital at end of year	Cases remaining in Hospital from previous year	Total Admis- sion	Total Deaths	Total Cases Treated	Remaining in Hospital at end of year	Cases remaining in Hospital from previous year	Total Admis- sion	Total Deaths	Total Cases Treated	Cases remaining in Hospital from previous year	Total Admis- sion	Total Deaths	Total Cases Treated	Remaining in Hospital at end of year	
V.—AFFECTIONS OF THE RESPIRATORY SYSTEM—(Contd.).																				
98. Affections of the Larynx—																				
Laryngitis .. ..	..	1	..	1	..	..	2	..	2	..	..	3	..	3	..	32	3	32	1	1
99. Bronchitis—																				
(a) Acute .. ..	..	21	..	21	..	..	15	..	15	..	..	43	..	43	..	1,190	17	1,224	26	26
(b) Chronic .. ..	..	1	..	1	..	..	..	..	..	..	..	..	..	..	3	132	24	135	6	6
100. Broncho-pneumonia ..	..	..	..	..	..	..	1	..	1	..	1	..	..	1	7	332	95	339	13	13
101. Pneumonia—																				
(a) Lobar .. ..	..	..	..	..	..	..	9	4	9	..	..	4	..	4	28	1,227	262	1,255	56	56
(b) Unclassified .. ..	..	..	..	..	..	1	1	1	2	..	..	6	..	6	2	250	59	252	19	19
102. Pleurisy, Empyema ..	..	1	1	1	..	..	3	..	3	..	..	2	..	2	2	86	3	88	7	7
103. Congestion of the Lungs ..	..	..	..	..	..	..	2	..	2	..	..	..	..	..	..	30	1	30	2	2
104. Gangrene of the Lungs..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	2	2	..	..
105. Asthma .. ..	..	1	..	1	..	..	3	..	3	..	..	17	..	17	5	77	4	82	1	1
106. Pulmonary Emphysema ..	..	..	..	..	..	..	1	..	1	..	..	..	..	1	..	2	1	2	..	..
107. Other affections of the Lungs ..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	28	4	28	..	..
Pulmonary Spirochaetosis ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Pleurodynia .. ..	..	1	..	1	..	..	1	..	1	..	..	..	..	..	..	4	..	4	..	..
VI.—DISEASES OF THE DIGESTIVE SYSTEM.																				
108. A.—Diseases of Teeth or Gums—																				
Caries .. ..	..	9	..	9	..	..	4	..	4	..	..	2	..	2	..	30	..	30	1	1
Pyorrhœa .. ..	..	..	..	..	..	..	8	..	8	..	..	20	..	20	3	25	..	28	..	..
B.—Other affections of the Mouth																				
Stomatitis .. ..	..	3	..	3	..	..	1	..	1	..	..	6	..	6	..	11	..	11	..	..
Glossitis .. ..	..	..	..	..	..	..	2	..	2	1	..	..	..	..	1	31	3	32	..	..
109. Affections of the Pharynx or Tonsils—																				
Tonsillitis .. ..	..	5	..	5	..	..	5	..	5	..	..	37	..	37	..	150	2	152	5	5
Pharyngitis .. ..	..	40	..	41	1	..	71	..	71	..	1	27	..	27	2	60	..	62	2	2

DISEASES	EUROPEAN OFFICIALS				EUROPEAN GENERAL POPULATION (NON-OFFICIAL)				NON-EUROPEAN OFFICIALS (including ASIATICS)				NATIVE GENERAL POPULATION (including ASIATICS)			
	Cases remaining in Hospital from previous year	Total Admis- sion	Total Deaths	Total Cases Treated	Remaining in Hospital at end of year	Cases remaining in Hospital from previous year	Total Admis- sion	Total Deaths	Total Cases Treated	Remaining in Hospital at end of year	Cases remaining in Hospital from previous year	Total Admis- sion	Total Deaths	Total Cases Treated	Remaining in Hospital at end of year	
VI.—DISEASES OF THE DIGESTIVE SYSTEM—(Contd.).																
110. Affections of the Oesophagus	..	..	..	..	..	..	4	..	..	1	..	2	..	2	..	
111. A.—Ulcer of the Stomach	..	..	..	1	..	..	2	1	..	..	..	4	2	4	..	
B.—Ulcer of the Duodenum	..	1	..	..	..	..	..	..	..	..	..	3	..	3	..	
112. Other affections of the Stomach—																
Gastritis ..	..	4	..	4	..	..	10	..	1	1	..	3	2	3	..	
Dyspepsia ..	..	16	..	16	..	..	4	..	20	..	1	36	..	36	1	
	..	9	..	9	..	..	14	..	14	..	..	100	..	101	2	
113. Diarrhoea and Enteritis—																
Under two years	..	1	..	1	..	..	9	..	..	..	1	126	25	127	5	
114. Diarrhoea and Enteritis—																
Two years and over	..	36	..	36	..	..	45	..	19	1	6	212	10	218	5	
Colitis ..	..	4	..	4	..	..	15	..	5	..	..	61	..	61	2	
Ulceration	..	..	..	..	..	..	2	..	..	..	..	..	..	..	..	
Colic ..	..	9	..	9	1	..	..	..	47	..	..	30	..	30	..	
114A. Sprue	..	..	..	2	..	..	6	..	..	..	5	891	7	896	37	
115. Ankylostomiasis	..	2	..	..	..	..	..	..	..	..	..	..	..	..	..	
116. Diseases due to Intestinal Para- sites	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	
(a) Cestoda (Tænia)	..	1	..	1	..	..	1	..	..	..	4	685	..	689	12	
(b) Trematoda (Flukes)	..	..	..	..	..	..	..	..	..	..	..	13	..	13	1	
(c) Nematoda (other than Ankylostoma)	..	..	..	..	..	..	..	..	..	..	..	40	..	40	..	
Ascariis	..	..	..	..	..	..	1	..	..	..	22	1,072	2	1,094	30	
Trichocephalus dispar.	..	..	..	..	..	..	..	..	..	..	..	133	..	133	..	
Trichina	..	..	..	..	..	..	..	..	..	..	..	2	..	2	..	
Dracunculus	..	..	..	..	..	..	..	..	..	..	..	5	..	5	..	
Strongylus	..	1	..	1	..	..	..	..	..	..	..	27	..	27	..	
Oxyuris	..	1	..	1	..	..	..	..	..	..	..	10	..	10	..	
(d) Coccidia	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	
(e) Other Parasites	..	..	..	..	..	..	3	..	..	..	4	45	1	49	2	
(f) Unclassified	..	1	..	1	..	..	..	..	..	..	..	19	..	19	..	
117. Appendicitis	3	16	..	19	2	..	36	..	2	..	1	26	2	27	1	
118. Hernia	..	3	..	3	..	..	6	1	5	..	12	156	7	168	8	
119. A.—Affections of the Anus—Fistula, etc.	..	..	..	..	..	..	4	..	2	..	1	25	..	26	2	



RETURN OF DISEASES—IN-PATIENTS—(Contd.).

M E D

72

DISEASES	EUROPEAN OFFICIALS				EUROPEAN GENERAL POPULATION (NON-OFFICIAL)				NON-EUROPEAN OFFICIALS (including ASIATICS)				NATIVE GENERAL POPULATION (including ASIATICS)			
	Cases remaining in Hospital from previous year	Total Admis- sion	Total Deaths	Total Cases Treated	Remaining in Hospital at end of year	Cases remaining in Hospital from previous year	Total Admis- sion	Total Deaths	Total Cases Treated	Remaining in Hospital at end of year	Cases remaining in Hospital from previous year	Total Admis- sion	Total Deaths	Total Cases Treated	Remaining in Hospital at end of year	
VI.—DISEASES OF THE DIGESTIVE SYSTEM—(Contd.).																
B.—Other affections of the In- testines—																
Enteroptosis ..	..	4	..	4	..	..	6	1	6	..	..	5	..	5	..	..
Constipation... ..	..	.. 1	..	.. 1	..	..	15	..	15	..	..	.. 8	..	.. 8	..	.. 3
120. Acute Yellow Atrophy of the Liver ..	..	..	..	..	..	..	..	..	..	..	.. 3	.. 1	.. 1	.. 4	..	..
121. Hydatid of the Liver ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
122. Cirrhosis of the Liver—																
(a) Alcoholic ..	..	..	..	..	..	..	.. 2	.. 1	.. 2	..	.. 6	2	.. 22	2	45	2
(b) Other forms ..	..	..	..	..	..	..	4	..	4	..	..	1	.. 3	1	8	5
123. Biliary Calculus ..	..	.. 7	..	.. 7	..	..	2	..	2	..	..	8	4	28	78	1
124. Other affections of the Liver—																
Abscess ..	..	.. 7	..	.. 7	..	..	8	..	8	..	3	75	2	78	5	1
Hepatitis ..	..	5	..	5	..	..	9	..	10	..	..	5	3	5	14	..
Cholecystitis ..	..	1	..	1	..	..	1	..	1	..	..	14	..	14	..	..
Jaundice ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
125. Diseases of the Pancreas ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Pneumococcal Peritonitis ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
126. Peritonitis (ot unknown cause) ..	..	..	..	..	..	..	..	..	..	..	..	19	10	20	1	1
127. Other affections of the Digestive ..	..	5	..	5	..	1	4	..	5	..	3	42	5	45	..	..
System ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
VII.—DISEASES OF THE GENITO- URINARY SYSTEM (NON-VENEREAL).																
128. Acute Nephritis ..	..	2	..	2	..	..	6	..	6	..	..	68	22	70	4	4
129. Chronic Nephritis ..	..	..	..	..	..	.. 1	4	..	5	..	5	31	7	36	..	..
130. A.—Chyluria ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Bilharzia ..	..	..	..	..	..	..	..	..	..	..	..	2	..	2	..	..
B.—Schistosomiasis ..	..	..	..	..	..	..	1	..	1	..	7	203	5	210	8	8
131. Other affections of the Kidneys—																
Uræmia ..	..	6	..	6	..	..	7	..	7	..	..	15	4	15	..	..
Pyelitis ..	..	2	..	2	..	..	16	..	16	..	..	2	2	2	..	2
Urinary Calculus...	..	2	..	2	..	..	..	..	..	..	..	17	..	18	..	..
133. Diseases of the Bladder—																
Cystitis ..	..	.. 5	..	.. 5	..	..	3	..	3	..	1	53	2	54	1	1

DISEASES	EUROPEAN OFFICIALS					EUROPEAN GENERAL POPULATION (NON-OFFICIAL)					NON-EUROPEAN OFFICIALS (including ASIATICS)					NATIVE GENERAL POPULATION (including ASIATICS)				
	Cases remaining in Hospital from previous year	Total Admis- sion	Total Deaths	Total Cases Treated	Remaining in Hospital at end of year	Cases remaining in Hospital from previous year	Total Admis- sion	Total Deaths	Total Cases Treated	Remaining in Hospital at end of year	Cases remaining in Hospital from previous year	Total Admis- sion	Total Deaths	Total Cases Treated	Remaining in Hospital at end of year	Cases remaining in Hospital from previous year	Total Admis- sion	Total Deaths	Total Cases Treated	Remaining in Hospital at end of year
VII.—DISEASES OF THE GENITO-URINARY SYSTEM (NON-VENEREAL) —(Contd.).																				
134. Diseases of the Urethra—																				
(a) Stricture .. .. .	1	2	..	3	..	..	1	..	1	..	..	..	..	..	..	..	20	..	20	2
(b) Other .. .. .	..	1	..	1	..	..	1	..	1	..	..	1	..	..	..	..	20	1	20	..
135. Diseases of the Prostate—																				
Hypertrophy .. .. .	..	..	..	..	..	..	2	..	2	..	..	..	..	..	..	..	2	..	2	..
Prostatitis .. .. .	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	5	..	5	..
136. Diseases (Non-venereal) of the Genital Organs of Man .. .. .	..	3	..	3	..	..	6	..	6	..	..	..	..	..	..	..	54	..	54	..
Epididymitis .. .. .	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	18	..	18	1
Orchitis .. .. .	..	1	..	1	..	..	..	..	..	..	..	5	..	..	..	..	74	..	76	3
Hydrocele .. .. .	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	3	92	1	95	2
Ulcer of Penis .. .. .	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	31	..	33	2
Phymosis .. .. .	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	93	..	94	..
137. Cysts or other Non-malignant Tumours of the Ovaries .. .. .	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
138. Salpingitis—	..	..	..	..	..	..	1	..	1	..	..	..	..	..	..	..	23	2	23	..
Abscess of the Pelvis .. .. .	..	..	..	..	..	1	2	..	3	..	..	..	..	..	..	..	19	..	19	..
139. Uterine Tumours (Non-malignant) .. .. .	..	..	..	..	..	..	1	..	1	..	..	..	..	..	..	2	12	1	14	1
140. Uterine Haemorrhage (Non-puerperal) .. .. .	..	..	..	..	..	..	4	..	4	..	..	..	..	..	..	1	29	4	30	1
141. A.—Metritis .. .. .	..	1	..	1	..	..	4	..	4	..	..	..	..	..	..	1	5	1	6	1
B.—Other affections of the Female Genital Organs .. .. .	..	..	..	..	..	1	8	..	9	..	..	..	..	..	..	5	33	1	38	1
Displacement of Uterus .. .. .	..	..	..	..	..	..	11	..	11	..	..	..	..	..	..	2	20	1	22	..
Amenorrhœa .. .. .	..	..	..	..	..	..	3	..	3	..	..	..	..	..	..	3	53	..	56	1
Leucorrhœa .. .. .	..	..	..	..	..	..	1	..	1	..	..	..	..	..	..	..	1	..	1	..
Dysmennorrhœa .. .. .	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	3	..	3	..
142. Diseases of the Breast (Non-puerperal)—	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Mastitis .. .. .	..	..	..	..	..	..	2	..	2	..	..	..	..	..	..	3	32	..	35	1
Abscess of Breast .. .. .	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	20	..	20	1
Tumour .. .. .	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	1	..



RETURN OF DISEASES—IN-PATIENTS—(Contd.).

DISEASES	EUROPEAN OFFICIALS				EUROPEAN GENERAL POPULATION (NON-OFFICIAL)				NON-EUROPEAN OFFICIALS (including ASIATICS)				NATIVE GENERAL POPULATION (including ASIATICS)			
	Cases remaining in Hospital from previous year	Total Admis- sion	Total Deaths	Total Cases Treated	Remaining in Hospital at end of year	Cases remaining in Hospital from previous year	Total Admis- sion	Total Deaths	Total Cases Treated	Remaining in Hospital at end of year	Cases remaining in Hospital from previous year	Total Admis- sion	Total Deaths	Total Cases Treated	Remaining in Hospital at end of year	
VIII.—PUERPERAL STATE.																
143. A.—Normal Labour .. ..	..	..	..	..	..	1	18	..	19	..	..	292	2	308	8	
B.—Accidents of Pregnancy—	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	
(a) Abortion .. ..	..	..	..	..	1	1	5	..	6	..	..	83	..	83	2	
(b) Ectopic Gestation .. ..	..	..	..	..	..	1	1	..	2	..	..	3	2	3	..	
(c) Other accidents of Pregnancy	..	..	..	..	..	..	12	..	12	..	..	70	9	70	2	
144. Puerperal Hæmorrhage .. ..	..	..	..	..	..	..	..	..	..	..	..	2	..	2	..	
145. Other accidents of Parturition ..	..	..	..	..	..	..	1	..	1	..	2	61	12	63	..	
146. Puerperal Septicæmia .. ..	..	..	..	..	..	..	1	..	1	..	1	29	14	30	1	
147. Phlegmasia Dolens .. ..	..	..	..	..	..	..	..	..	..	..	..	1	..	1	..	
148. Puerperal Eclampsia .. ..	..	..	..	..	..	..	..	..	..	..	..	3	2	3	..	
149. Sequelæ of Labour .. ..	..	..	..	..	..	..	..	..	..	..	..	28	6	29	3	
150. Puerperal affections of the Breast	..	..	..	..	..	..	..	..	..	..	..	1	..	1	..	
Caesarian Section .. ..	..	..	..	..	..	..	..	..	..	..	1	..	..	1	..	
IX.—AFFECTIONS OF THE SKIN AND CELLULAR TISSUES.																
Cancrum Oris .. ..																
151. Gangrene .. ..	..	..	..	..	..	..	..	..	..	..	..	2	2	2	..	
152. Boil .. ..	..	7	..	7	1	..	3	..	3	..	..	24	4	25	3	
Carbuncle .. ..	..	3	..	3	..	..	4	..	4	..	..	91	..	107	1	
153. Abscess .. ..	..	12	..	12	..	..	28	..	28	..	..	20	..	21	1	
Whitlow .. ..	..	3	..	3	..	..	4	..	4	..	1	601	5	626	23	
Cellulitis .. ..	..	13	..	13	..	..	20	..	20	..	..	47	..	49	2	
154. A.—Tinea .. ..	..	..	..	..	..	..	..	..	..	..	16	287	5	303	12	
B.—Scabies .. ..	..	..	..	..	..	..	..	..	..	..	..	12	..	12	..	
155. Other Diseases of the Skin—	..	4	..	4	..	..	6	..	6	..	7	256	..	263	9	
Erythema .. ..	..	..	..	..	..	..	..	..	..	..	6	175	1	181	13	
Urticaria .. ..	..	1	..	1	..	..	2	..	2	..	..	5	..	5	..	
Eczema .. ..	..	..	..	..	..	..	1	..	1	..	6	25	..	25	..	
Herpes .. ..	..	1	..	1	..	..	1	..	1	..	..	71	..	77	6	
Dermatitis .. ..	..	1	..	1	..	..	..	..	..	..	..	20	..	20	..	
Psoriasis .. ..	..	..	..	..	..	..	..	..	..	..	2	69	..	71	2	
Elephantiasis .. ..	..	..	..	..	..	..	..	..	..	..	..	3	..	..	..	
Myiasis .. ..	..	..	..	..	..	..	..	..	..	..	3	66	1	69	7	
Chigoes .. ..	..	2	..	2	..	..	3	..	3	..	..	6	..	6	..	
Cutaneous Leishmaniasis	..	..	..	..	..	..	..	..	..	..	1	59	..	60	7	
Ulcers .. ..	..	..	..	..	..	..	2	..	2	..	..	..	..	..	..	
Impetigo .. ..	..	1	..	1	..	..	..	..	..	..	266	3,484	9	3,750	379	
	..	..	..	..	..	..	..	..	..	..	..	42	..	42	1	

## RETURN OF DISEASES—IN-PATIENTS—(Contd.).

DISEASES	EUROPEAN OFFICIALS				EUROPEAN GENERAL POPULATION (NON-OFFICIAL)				NON-EUROPEAN OFFICIALS (including ASIATICS)				NATIVE GENERAL POPULATION (including ASIATICS)			
	Cases remaining in Hospital from previous year	Total Admis- sion	Total Deaths	Total Cases Treated	Remaining in Hospital at end of year	Cases remaining in Hospital from previous year	Total Admis- sion	Total Deaths	Total Cases Treated	Remaining in Hospital at end of year	Cases remaining in Hospital from previous year	Total Admis- sion	Total Deaths	Total Cases Treated	Remaining in Hospital at end of year	
X.—DISEASES OF BONES AND ORGANS OF LOCOMOTION (OTHER THAN TUBERCULOUS).																
156. Diseases of Bones— Osteitis .. .. .	.. .. .	.. .. .	.. .. .	.. .. .	.. .. .	.. .. .	3	.. .. .	.. .. .	.. .. .	.. .. .	.. .. .	50 .. .	2 .. .	50 .. .	2 .. .
157. Diseases of Joints— Arthritis .. .. . Synovitis .. .. .	.. .. . .. .. . .. .. .	2 .. . 10 .. .	.. .. . .. .. . .. .. .	2 .. . 4 .. . 4 .. .	.. .. . .. .. . .. .. .	.. .. . .. .. . .. .. .	.. .. . 4 .. . 3 .. .	.. .. . .. .. . .. .. .	.. .. . 4 .. . 3 .. .	.. .. . .. .. . .. .. .	.. .. . 22 .. . 5 .. .	.. .. . 128 .. . 155 .. .	.. .. . 2 .. . .. .. .	.. .. . 150 .. . 160 .. .	.. .. . 11 .. . 12 .. .	
158. Other Diseases of Bones or Organs of Locomotion .. .. . Myalgia .. .. .	.. .. . .. .. .	29 .. . .. .. .	.. .. . .. .. .	29 .. . .. .. .	2 .. . .. .. .	.. .. . .. .. .	5 .. . .. .. .	.. .. . .. .. .	28 .. . 5 .. .	1 .. . .. .. .	31 .. . 1 .. .	307 .. . 39 .. .	6 .. . .. .. .	338 .. . 40 .. .	22 .. . 1 .. .	
XI.—MALFORMATIONS.																
159. Malformations .. .. . Hydrocephalus .. .. . Hypospadias .. .. . Spina Bifida .. .. .	.. .. . .. .. . .. .. . .. .. .	.. .. . .. .. . .. .. . .. .. .	.. .. . .. .. . .. .. . .. .. .	.. .. . .. .. . .. .. . .. .. .	.. .. . .. .. . .. .. . .. .. .	.. .. . .. .. . .. .. . .. .. .	.. .. . .. .. . .. .. . .. .. .	.. .. . .. .. . .. .. . .. .. .	.. .. . .. .. . .. .. . .. .. .	.. .. . .. .. . .. .. . .. .. .	.. .. . .. .. . .. .. . .. .. .	.. .. . .. .. . .. .. . .. .. .	8 .. . 1 .. . .. .. . 3 .. .	1 .. . .. .. . .. .. . .. .. .	8 .. . 1 .. . .. .. . 3 .. .	.. .. . .. .. . .. .. . .. .. .
XII.—DISEASES OF INFANCY.																
160. Congenital Debility .. .. .	.. .. .	.. .. .	.. .. .	.. .. .	.. .. .	.. .. .	.. .. .	.. .. .	.. .. .	.. .. .	.. .. .	14 .. .	2 .. .	14 .. .	.. .. .	
161. Premature Birth .. .. .	.. .. .	.. .. .	.. .. .	.. .. .	.. .. .	.. .. .	.. .. .	.. .. .	.. .. .	.. .. .	.. .. .	14 .. .	12 .. .	14 .. .	2 .. .	
162. Other affections of Infancy Inanition .. .. .	.. .. . .. .. .	.. .. . .. .. .	.. .. . .. .. .	.. .. . .. .. .	1 .. . .. .. .	.. .. . .. .. .	5 .. . .. .. .	.. .. . .. .. .	.. .. . .. .. .	.. .. . .. .. .	.. .. . .. .. .	23 .. . 1 .. .	6 .. . 1 .. .	23 .. . 1 .. .	2 .. . .. .. .	
163. Infant neglect (infants of three months or over) .. .. .	.. .. .	.. .. .	.. .. .	.. .. .	.. .. .	.. .. .	.. .. .	.. .. .	.. .. .	.. .. .	.. .. .	3 .. .	.. .. .	3 .. .	.. .. .	
XIII.—AFFECTIONS OF OLD AGE.																
164. Senility— Senile Dementia .. .. .	.. .. . .. .. .	.. .. . .. .. .	.. .. . .. .. .	.. .. . .. .. .	.. .. . .. .. .	.. .. . .. .. .	.. .. . .. .. .	.. .. . .. .. .	.. .. . .. .. .	.. .. . .. .. .	1 .. . .. .. .	17 .. . .. .. .	7 .. . .. .. .	18 .. . .. .. .	1 .. . .. .. .	



RETURN OF DISEASES—IN-PATIENTS—(Contd.).

DISEASES	EUROPEAN OFFICIALS				EUROPEAN GENERAL POPULATION (NON-OFFICIAL)				NON-EUROPEAN OFFICIALS (including ASIATICS)				NATIVE GENERAL POPULATION (including ASIATICS)			
	Cases remaining in Hospital from previous year	Total Admis- sion	Total Deaths	Total Cases Treated	Remaining in Hospital at end of year	Cases remaining in Hospital from previous year	Total Admis- sion	Total Deaths	Total Cases Treated	Remaining in Hospital at end of year	Cases remaining in Hospital from previous year	Total Admis- sion	Total Deaths	Total Cases Treated	Cases remaining in Hospital from previous year	Remaining in Hospital at end of year
XIV.—AFFECTIONS PRODUCED BY EXTERNAL CAUSES.																
165. Suicide by Poisoning .. ..	..	..	..	..	..	..	..	..	..	..	..	2	2	2	..	..
166. Corrosive Poisoning (intentional) ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
167. Suicide by Gas Poisoning ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
168. Suicide by Hanging or Strangulation .. ..	..	..	..	..	..	..	..	..	..	..	..	1	..	1	..	..
169. Suicide by Drowning .. ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
170. Suicide by Firearms .. ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
171. Suicide by Cutting or Stabbing Instruments .. ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
172. Suicide by jumping from a height .. ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
173. Suicide by Crushing .. ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
174. Other Suicides .. ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
175. Food Poisoning— Botulism .. ..	..	2	..	2	..	..	7	..	7	..	..	5	1	5	..	..
176. Attacks of Poisonous Animals ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Snake Bite .. ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	3	..
Insect Bite .. ..	..	1	..	1	..	..	4	..	4	..	..	60	2	63	..	..
177. Other Accidental Poisonings ..	..	..	..	..	..	..	4	..	4	..	..	18	..	19	..	..
178. Burns (by Fire) .. ..	..	3	..	3	..	1	2	1	2	..	..	16	3	16	..	1
179. Burns (other than by Fire) ..	..	2	..	2	..	..	1	..	1	..	..	332	40	361	29	34
180. Suffocation (Accidental) ..	..	..	..	..	..	..	..	..	..	..	..	77	7	85	8	4
181. Poisoning by Gas (Accidental) ..	..	..	..	..	..	..	..	..	..	..	..	1	..	1	..	..
182. Drowning (Accidental) .. ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
183. Wounds (by Firearms, War accepted) .. ..	..	..	..	..	..	..	3	..	3	..	..	32	6	32	..	5
184. Wounds (by Cutting or Stabbing Instruments) .. ..	..	..	..	..	..	..	3	..	3	..	..	479	12	499	20	22
185. Wounds (by Fall) .. ..	..	4	..	4	..	..	4	2	4	..	..	182	3	191	9	4
186. Wounds (in Mines or Quarries) ..	..	..	..	..	..	..	..	..	..	..	..	2	..	3	1	..

## RETURN OF DISEASES—IN-PATIENTS—(Contd.).

[illegible]



### RETURN OF DISEASES--IN-PATIENTS--(Contd.).

[illegible]

TABLE VI.

COLONY AND PROTECTORATE OF KENYA.

RETURN OF DISEASES (Out-Patients).

NUMBERS TREATED DURING THE YEAR 1933.

DISEASES	EUROPEAN OFFICIALS			EUROPEAN GENERAL POPULATION (NON-OFFICIAL)			NON-EUROPEAN OFFICIALS (including ASIATICS)			NATIVE GENERAL POPULATION (including ASIATICS)		
	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total
I.—EPIDEMIC, ENDEMIC AND INFECTIOUS DISEASES.												
1. Enteric Group—												
(a) Typhoid Fever	..	..	..	..	..	..	..	..	..	..	1	1
(b) Paratyphoid A	..	..	..	..	..	..	..	..	..	..	..	..
(c) Paratyphoid B.	..	..	..	..	..	..	..	..	..	..	..	..
(d) Type not defined	..	..	..	..	..	..	..	..	..	..	..	..
T.A.B. Reaction	..	..	..	..	..	..	..	..	..	31	..	31
2. Typhus ..	..	..	..	..	..	..	..	..	..	..	..	..
3. Relapsing Fever ..	..	..	..	..	..	..	..	..	..	27	3	30
4. Undulant Fever ..	..	..	..	..	..	..	..	..	..	1	..	1
5. Malaria—												
(a) Tertian ..	3	..	3	16	2	18	7	..	7	770	202	972
(b) Quartan ..	2	..	2	2	2	4	10	..	10	374	144	518
(c) Aestivo-autumnal ..	1	1	2	19	14	33	39	..	39	2,092	589	2,681
Clinical ..	12	..	12	21	1	22	336	..	336	9,254	2,181	11,435
(d) Undifferentiated	..	..	..	3	..	3	..	..	..	621	302	923
(e) Cachexia ..	..	..	..	3	..	3	..	..	..	469	192	661
(f) Blackwater ..	..	..	..	..	..	..	..	..	..	3	1	4
6. Smallpox ..	..	..	..	..	..	..	..	..	..	..	..	..
Alastrim ..	..	..	..	..	..	..	..	..	..	..	..	..
7. Measles ..	..	..	..	..	..	..	5	..	5	131	65	196
8. Scarlet Fever ..	..	..	..	..	..	..	..	..	..	..	..	..
9. Whooping Cough	..	..	..	..	..	..	6	..	6	200	303	503
0. Diphtheria..	..	..	..	..	..	..	..	..	..	..	..	..
11. Influenza ..	15	..	15	12	3	15	827	..	827	8,025	1,248	9,273
12. Miliary Fever	..	..	..	..	..	..	2	..	2	105	11	116
13. Mumps ..	..	..	..	..	..	..	..	..	..	..	..	..
14. Cholera ..	..	..	..	..	..	..	..	..	..	25	5	30
15. Epidemic Diarrhœa	..	..	..	..	..	..	5	..	5	44	10	54
16. Dysentery ..	9	1	10	6	11	17	8	..	8	117	89	206
(a) Amœbic	..	..	..	3	..	3	2	..	2	57	30	87
(b) Bacillary	..	..	..	..	..	..	..	..	..	..	..	..
(c) Undefined or due to other causes ..	..	..	..	..	1	1	2	..	2	176	65	241



## RETURN OF DISEASES--OUT-PATIENTS--(Contd.).

DISEASES	EUROPEAN OFFICIALS			EUROPEAN GENERAL POPULATION (NON-OFFICIAL)			NON-EUROPEAN OFFICIALS (including ASIATICS)			NATIVE GENERAL POPULATION (including ASIATICS)		
	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total
I.—EPIDEMIC, ENDEMIC AND INFECTIOUS DISEASES—(Contd.).												
17. Plague—												
(a) Bubonic .. .. .	..	..	..	..	..	..	..	..	..	2	1	3
(b) Pneumonic .. .. .	..	..	..	..	..	..	..	..	..	..	1	1
(c) Septicæmic .. .. .	..	..	..	..	..	..	..	..	..	..	..	..
(d) Undefined .. .. .	..	..	..	..	..	..	..	..	..	..	..	..
18. Yellow Fever .. .. .	..	..	..	..	..	..	..	..	..	..	..	..
19. Spirochætosus ictero-hæmorrhagica .. .. .	..	..	..	..	..	..	..	..	..	..	..	..
20. Leprosy .. .. .	..	..	..	..	..	..	..	..	..	64	10	74
21. Erysipelæ .. .. .	..	..	..	1	..	1	..	..	1	1	3	4
22. Acute Poliomyelitis .. .. .	..	..	..	..	..	..	..	..	..	..	..	..
23. Encephalitis Lethargica .. .. .	..	..	..	..	..	..	..	..	..	..	..	..
24. Epidemic Cerebro-spinal Fever .. .. .	..	..	..	..	..	..	..	..	..	..	..	..
25. Other Epidemic Diseases—												
(a) Rubella (German Measles) .. .. .	..	..	..	..	..	..	..	..	..	..	..	..
(b) Varicella (Chicken-pox) .. .. .	..	..	..	..	..	..	..	..	..	..	..	..
(c) Kala-azar .. .. .	..	..	..	..	..	..	..	..	..	..	..	..
(d) Phlebotomus Fever .. .. .	..	..	..	1	..	1	..	..	..	..	..	..
(e) Dengue .. .. .	..	..	..	..	..	..	..	..	..	..	..	..
(f) Epidemic Dropsy .. .. .	..	..	..	..	..	..	..	..	..	..	..	..
(g) Yaws .. .. .	..	..	..	..	..	..	..	..	..	..	..	..
(h) Trypanosomiasis .. .. .	..	..	..	..	..	..	..	..	..	..	..	..
26. Glanders .. .. .	..	..	..	..	..	..	..	..	..	8,181	5,543	13,724
27. Anthrax .. .. .	..	..	..	..	..	..	..	..	..	2	..	2
28. Rabies .. .. .	..	..	..	..	..	..	..	..	..	29	5	34
29. Tetanus .. .. .	..	..	..	..	..	..	..	..	..	..	..	..
30. Mycosis .. .. .	..	..	..	..	..	..	..	..	..	2	1	3
31. Tuberculosis, Pulmonary and Laryngeal .. .. .	..	..	..	1	..	1	..	..	..	..	1	1
32. Tuberculosis of the Meninges or Central Nervous System .. .. .	..	..	..	..	..	..	..	..	..	138	75	213
33. Tuberculosis of the Intestines or Peritoneum .. .. .	..	..	..	..	..	..	..	..	..	..	..	..
34. Tuberculosis of the Vertebral Column .. .. .	..	..	..	..	..	..	..	..	..	..	1	1
35. Tuberculosis of Bones and Joints .. .. .	..	..	..	..	..	..	..	..	..	1	27	28

[illegible]



## RETURN OF DISEASES—OUT-PATIENTS—(Contd.).

[illegible]

## RETURN OF DISEASES—OUT-PATIENTS—(Contd.).

[illegible]



## RETURN OF DISEASES—OUT-PATIENTS—(Contd.).

[illegible]

RETURN OF DISEASES—OUT-PATIENTS—(Contd.).

DISEASES	EUROPEAN OFFICIALS			EUROPEAN GENERAL POPULATION (NON-OFFICIAL)			NON-EUROPEAN OFFICIALS (including ASIATICS)			NATIVE GENERAL POPULATION (including ASIATICS)		
	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total
IV.—AFFECTIONS OF THE CIRCULATORY SYSTEM—(Contd.).												
93. Diseases of the Veins—												
Hæmorrhoids .. ..	1	..	1	2	..	2	..	..	..	43	10	53
Varicose Veins .. ..	..	..	..	2	..	2	14	..	14	53	19	72
Phlebitis .. ..	..	..	..	1	..	1	1	..	1	3	..	3
94. Diseases of the Lymphatic System—	..	..	..	..	..	..	..	..	..	5	..	5
Lymphangitis .. ..	..	..	..	1	..	1	..	..	..	10	7	17
Lymphadenitis, Bubo (non-specific) .. ..	..	..	..	1	..	1	..	..	..	25	4	29
Adenitis .. ..	..	..	..	3	1	4	2	..	2	380	99	479
95. Hæmorrhage of undetermined cause .. ..	..	..	..	1	2	3	..	..	..	..	..	..
96. Other affections of the Circulatory System .. ..	4	..	4	2	..	2	1	..	1	1	..	1
V.—AFFECTIONS OF THE RESPIRATORY SYSTEM.												
97. Diseases of the Nasal Passages—												
Adenoids .. ..	2	..	2	1	1	2	3	..	3	51	9	60
Polypus .. ..	..	..	..	..	..	..	..	..	..	3	2	5
Dysphagia .. ..	1	..	1	..	..	..	..	..	..	..	..	..
Rhinitis .. ..	1	..	1	..	3	3	10	..	10	110	9	119
Coryza .. ..	31	..	31	17	14	31	152	..	152	4 331	1,236	5,567
98. Affections of the Larynx—	2	..	2	..	..	..	1	..	1	15	19	34
Laryngitis .. ..	..	..	..	1	1	2	4	..	4	280	35	315
99. Bronchitis—	..	..	..	..	..	..	..	..	..	..	..	..
(a) Acute .. ..	22	1	23	11	3	14	667	..	667	17,946	6,588	24 534
(b) Chronic .. ..	..	..	..	2	..	2	25	..	25	4,418	1,873	6,291
100. Broncho-pneumonia .. ..	..	..	..	..	..	..	..	..	..	156	86	242
101. Pneumonia—	..	..	..	..	..	..	14	..	14	19	6	25
(a) Lobar .. ..	..	..	..	..	..	..	..	..	..	165	67	232
(b) Unclassified .. ..	..	..	..	..	..	..	..	..	..	66	11	77
102. Pleurisy, Empyema .. ..	..	..	..	..	..	..	2	..	2	57	14	71
103. Congestion of the Lungs .. ..	..	..	..	..	..	..	..	..	..	..	26	26
104. Gangrene of the Lungs .. ..	..	..	..	..	..	..	1	..	1	137	..	137
105. Asthma .. ..	..	..	..	..	1	1	48	..	48	387	123	510
106. Pulmonary Emphysema .. ..	..	..	..	..	1	1	..	..	..	2	..	2
107. Other affections of the Lungs .. ..	..	..	..	..	..	..	1	..	1	892	329	1,221
Pulmonary Spirochætosis .. ..	..	..	..	..	..	..	..	..	..	..	..	..
Pleurodynia .. ..	1	..	1	..	2	2	..	..	..	175	77	252



RETURN OF DISEASES—OUT-PATIENTS—(Contd.).

DISEASES	EUROPEAN OFFICIALS			EUROPEAN GENERAL POPULATION (NON-OFFICIAL)			NON-EUROPEAN OFFICIALS (including ASIATICS)			NATIVE GENERAL POPULATION (including ASIATICS)		
	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total
VI.—DISEASES OF THE DIGESTIVE SYSTEM.												
108. <i>A.</i> —Diseases of Teeth or Gums—	1	..	1	..	3	3	17	..	17	151	20	171
Caries .. .. .	6	..	6	15	11	26	75	..	75	5,805	2,135	7,940
Pyorrhœa, etc. .. .	2	..	2	..	..	..	35	..	35	390	92	482
<i>B.</i> —Other affections of the Mouth	1	..	1	1	1	2	39	..	39	74	24	98
Stomatitis .. .. .	..	..	..	2	1	3	6	..	6	337	145	482
Glossitis, etc. .. .	1	..	1	..	..	..	..	..	..	23	5	28
109. Affections of the Pharynx or												
Tonsils .. .. .	..	..	..	..	1	1	2	..	2	95	18	113
Quinsy .. .. .	..	..	..	..	..	..	1	..	1	3	..	3
Tonsillitis .. .. .	18	..	18	8	6	14	122	..	122	1,460	457	1,917
Pharyngitis .. .. .	10	..	10	3	4	7	53	..	53	1,456	291	1,747
110. Affections of the Œsophagus ..	1	..	1	..	..	..	..	..	..	..	2	2
111. <i>A.</i> —Ulcer of the Stomach .. .	..	..	..	..	..	..	..	..	..	1	..	1
<i>B.</i> —Ulcer of the Duodenum .. .	..	..	..	..	..	..	..	..	..	..	..	..
112. Other affections of the Stomach..	4	..	4	6	1	7	15	..	15	96	103	199
Gastritis .. .. .	12	..	12	21	13	34	50	..	50	440	208	648
Dyspepsia .. .. .	..	..	..	..	..	..	65	..	65	2,330	1,219	3,549
113. Diarrhœa and Enteritis—												
Under two years .. .. .	..	..	..	15	7	22	..	..	..	415	502	917
114. Diarrhœa and Enteritis—												
Two years and over .. .. .	10	..	10	5	6	11	60	..	60	1,688	556	2,244
Colitis .. .. .	4	1	5	4	7	11	40	..	40	507	141	648
Ulceration .. .. .	..	..	..	..	..	..	..	..	..	936	53	989
Colic .. .. .	..	..	..	..	2	2	39	..	39	663	200	863
114A. Sprue .. .. .	..	..	..	..	..	..	..	..	..	..	..	..
115. Ankylostomiasis .. .. .	..	..	..	1	1	2	4	..	4	519	177	696
116. Diseases due to Intestinal Para-												
sites—												
(a) Cestoda (Tænia) .. .. .	..	..	..	2	..	2	..	..	..	1,396	672	2,068
(b) Trematoda (Flukes) .. .. .	..	..	..	7	..	7	14	..	14	14,817	3,479	18,296
(c) Nematoda (other than —	..	..	..	..	..	..	..	..	..	9	2	11
Ankylostoma) .. .. .	..	..	..	..	..	..	..	..	..	..	..	..
Ascaris .. .. .	..	..	..	1	..	1	3	..	3	3,148	3,268	6,416
Trichocephalus dispar. .. .. .	..	..	..	..	..	..	..	..	..	51	18	69
Trichina .. .. .	..	..	..	..	..	..	..	..	..	1	..	1
Dracunculus.. .. .	..	..	..	..	..	..	..	..	..	1	..	1
Strongylus .. .. .	..	..	..	..	..	..	..	..	..	28	8	36
Oxyuris .. .. .	..	..	..	4	..	4	..	..	..	18	19	37
(d) Coccidia .. .. .	..	..	..	..	..	..	..	..	..	..	..	..
(e) Other Parasites .. .. .	1	..	1	1	..	1	1	..	1	245	116	361
(f) Unclassified .. .. .	..	..	..	..	..	..	..	..	..	1,915	596	2,511

RETURN OF DISEASES—OUT-PATIENTS—(Contd.).

DISEASES	EUROPEAN OFFICIALS			EUROPEAN GENERAL POPULATION (NON-OFFICIAL)			NON-EUROPEAN OFFICIALS (including ASIATICS)			NATIVE GENERAL POPULATION (including ASIATICS)		
	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total
VI.—DISEASES OF THE DIGESTIVE SYSTEM—(Contd.).												
117. Appendicitis .. .. .	1	..	1	3	2	5	5	..	5	1	..	1
118. Hernia .. .. .	..	..	..	1	..	1	3	..	3	108	3	111
119. A.—Affections of the Anus Fistula, etc. .. .. .	..	..	..	..	..	..	..	..	..	12	6	18
B.—Other affections of the In- testines—	1	..	1	1	..	1	3	..	3	7	11	18
Enteroptosis .. .. .	..	..	..	..	..	..	1	..	1	10	1	11
Constipation.. .. .	36	..	36	2	3	5	248	..	248	10,497	4,852	15,349
120. Acute Yellow Atrophy of the Liver .. .. .	..	..	..	..	..	..	..	..	..	..	..	..
121. Hydatid of the Liver .. .. .	..	..	..	..	..	..	..	..	..	..	..	..
122. Cirrhosis of the Liver— (a) Alcoholic .. .. .	..	..	..	..	..	..	..	..	..	1	..	1
(b) Other forms .. .. .	..	..	..	..	1	1	..	..	..	2	1	3
123. Biliary Calculus .. .. .	..	..	..	..	..	..	..	..	..	1	..	1
124. Other affections of the Liver— Abscess .. .. .	..	..	..	..	..	..	..	..	..	1	..	1
Hepatitis .. .. .	3	..	3	3	1	4	6	..	6	5	1	6
Cholecystitis .. .. .	1	..	1	..	..	..	..	..	..	118	24	142
Jaundice .. .. .	..	..	..	1	..	1	..	..	..	7	2	9
125. Diseases of the Pancreas .. .. .	..	..	..	..	..	..	..	..	..	19	2	21
126. Peritonitis (of unknown cause).. .. .	..	..	..	..	..	..	..	..	..	..	..	..
127. Other affections of the Digestive System .. .. .	1	..	1	2	1	3	2	..	2	201	37	238
VII.—DISEASES OF THE GENITO- URINARY SYSTEM (NON-VENEREAL).												
128. Acute Nephritis .. .. .	..	..	..	..	1	1	..	..	..	19	6	25
129. Chronic Nephritis .. .. .	..	..	..	..	..	..	..	..	..	16	..	16
130. A.—Chyluria .. .. .	..	..	..	..	..	..	3	..	3	..	1	1
B.—Schistosomiasis .. .. .	..	..	..	..	..	..	..	..	..	135	..	135
131. Other affections of the Kidneys— Pyelitis .. .. .	1	..	1	..	2	2	..	..	..	7	18	25
132. Urinary Calculus.. .. .	..	..	..	..	..	..	3	..	3	13	3	16
133. Diseases of the Bladder— Cystitis .. .. .	..	..	..	3	3	6	1	..	1	..	..	..
	..	..	..	3	3	6	26	..	26	100	36	136



RETURN OF DISEASES—OUT-PATIENTS—(Contd.).

DISEASES	EUROPEAN OFFICIALS			EUROPEAN GENERAL POPULATION (NON-OFFICIAL)			NON-EUROPEAN OFFICIALS (including ASIATICS)			NATIVE GENERAL POPULATION (including ASIATICS)		
	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total
VII.—DISEASES OF THE GENITO- URINARY SYSTEM (NON-VENEREAL) —(Contd.).												
134. Diseases of the Urethra— (a) Stricture .. ..	..	..	..	..	..	..	..	..	..	3	..	3
(b) Other .. ..	..	..	..	1	..	1	..	..	..	8	..	8
135. Diseases of the Prostate— Hypertrophy .. ..	..	..	..	1	..	..	2	..	2	101	2	103
Prostatitis .. ..	..	..	..	..	..	..	..	..	..	..	..	..
136. Diseases (Non-venereal) of the Genital Organs of Man— Phimosis .. ..	..	..	..	..	..	..	..	..	..	..	..	4
Epididymitis .. ..	..	..	..	1	..	1	..	..	..	24	..	24
Orchitis .. ..	1	..	1	2	..	2	5	..	..	59	..	59
Hydrocele .. ..	..	..	..	..	..	..	..	..	..	22	..	22
Ulcer of Penis .. ..	..	..	..	2	..	2	..	..	..	138	..	138
137. Cysts or other Non-malignant Tumours of the Ovaries ..	..	..	..	..	..	1	..	..	..	81	..	81
138. Salpingitis— Abscess of the Pelvis ..	..	..	..	..	1	1	..	..	..	19	..	19
139. Uterine Tumours (Non-malig- nant) .. ..	..	..	..	..	..	..	..	..	..	6	3	9
140. Uterine Hæmorrhage (Non- puerperal) .. ..	..	..	..	..	4	4	..	..	..	40	1	40
141. A.—Metritis .. ..	..	..	..	..	2	2	..	..	..	..	21	21
B.—Other affections of the Fe- male Genital Organs— Displacement of Uterus ..	..	..	..	..	5	5	..	..	..	24	6	24
Amenorrhœa .. ..	..	..	..	..	3	3	..	..	..	34	13	34
Dysmennorrhœa .. ..	..	..	..	..	1	1	..	..	..	6	60	60
Leucorrhœa .. ..	..	..	..	..	4	4	..	..	..	96	12	96
142. Diseases of the Breast (Non- puerperal)— Mastitis .. ..	..	..	..	..	2	2	..	..	..	..	7	7
Abscess of Breast .. ..	..	..	..	..	..	..	..	..	..	5	87	92
	..	..	..	..	..	..	..	..	..	1	18	19
VIII.—PUERPERAL STATE.												
143. A.—Normal Labour .. ..	..	..	..	..	..	..	..	..	..	..	96	96
B.—Accidents of Pregnancy— (a) Abortion .. ..	..	..	..	..	..	..	..	..	..	..	4	4
(b) Ectopic Gestation ..	..	..	..	..	..	..	..	..	..	..	82	82
(c) Other accidents of Pregnancy	..	..	..	..	..	..	..	..	..	..	18	18
	..	..	..	..	..	..	..	..	..	..	201	201

RETURN OF DISEASES—OUT-PATIENTS—(Contd.).

DISEASES	EUROPEAN OFFICIALS			EUROPEAN GENERAL POPULATION (NON-OFFICIAL)			NON-EUROPEAN OFFICIALS (including ASIATICS)			NATIVE GENERAL POPULATION (including ASIATICS)		
	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total
VIII.—PUERPERAL STATE—(Contd.).												
144. Puerperal Hamorrhage ..	..	..	..	..	..	..	..	..	..	..	1	1
145. Other accidents of Parturition ..	..	..	..	..	1	1	..	..	..	..	5	5
146. Puerperal Septicæmia ..	..	..	..	..	..	..	..	..	..	..	3	3
147. Phlegmasia Dolens ..	..	..	..	..	..	..	..	..	..	..	..	..
148. Puerperal Eclampsia ..	..	..	..	..	..	..	..	..	..	..	..	..
149. Sequelæ of Labour ..	..	..	..	..	..	..	..	..	..	..	47	47
150. Puerperal affections of the Breast	..	..	..	..	..	..	..	..	..	..	12	12
IX.—AFFECTIONS OF THE SKIN AND CELLULAR TISSUES.												
151. Gangrene ..	..	..	..	..	..	..	..	..	..	7	1	8
152. Boil ..	2	..	2	..	..	..	..	..	..	26	3	29
Carbuncle ..	10	..	10	..	6	17	..	..	..	1,539	332	1,871
153. Abscess ..	1	..	1	..	1	2	..	..	..	31	2	33
Whitlow ..	3	..	3	..	5	13	..	..	..	1,345	293	1,638
Cellulitis ..	2	..	2	..	1	4	..	..	..	200	44	244
154. A.—Tinea ..	1	..	1	..	..	4	..	..	..	1,280	279	1,559
B.—Scabies ..	1	..	1	..	1	3	..	..	..	2,298	1,302	3,600
155. Other Diseases of the Skin—	..	..	..	..	1	1	..	..	..	12,447	5,590	18,037
Erythema ..	12	..	12	..	8	22	..	..	..	499	107	606
Urticaria ..	1	..	1	..	..	..	..	..	..	54	17	71
Eczema ..	3	1	4	..	3	4	..	..	..	323	73	396
Herpes ..	1	..	1	..	1	1	..	..	..	671	312	983
Psoriasis ..	2	..	2	..	..	2	..	..	..	119	29	148
Elephantiasis ..	..	..	..	..	..	..	..	..	..	31	16	47
Myiasis ..	..	..	..	..	..	..	..	..	..	86	70	156
Chigoes ..	3	..	3	..	3	6	..	..	..	9	1	10
Cutaneous Leishmaniasis	..	..	..	..	..	..	..	..	..	3,531	1,703	5,234
Dermatitis ..	11	..	11	..	7	2	..	..	..	5	..	5
Ulcers ..	6	..	6	..	7	8	..	..	..	152	44	196
Impetigo ..	1	..	1	..	7	18	..	..	..	14,238	4,627	18,865
							5			361	156	517



## RETURN OF DISEASES--OUT-PATIENTS--(Contd.).

[illegible]

DISEASES	EUROPEAN OFFICIALS			EUROPEAN GENERAL POPULATION (NON-OFFICIAL)			NON-EUROPEAN OFFICIALS (including ASIATICS)			NATIVE GENERAL POPULATION (including ASIATICS)		
	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total
XIV.—AFFECTIONS PRODUCED BY EXTERNAL CAUSES.												
165. Suicide by Poisoning .. ..	..	..	..	..	..	..	..	..	..	..	..	..
166. Corrosive Poisoning (intentional) ..	..	..	..	..	..	..	..	..	..	..	..	..
167. Suicide by Gas Poisoning .. ..	..	..	..	..	..	..	..	..	..	..	..	..
168. Suicide by Hanging or Strangulation .. ..	..	..	..	..	..	..	..	..	..	..	..	..
169. Suicide by Drowning .. ..	..	..	..	..	..	..	..	..	..	1	..	1
170. Suicide by Firearms .. ..	..	..	..	..	..	..	..	..	..	..	..	..
171. Suicide by Cutting or Stabbing Instruments .. ..	..	..	..	..	..	..	..	..	..	..	..	..
172. Suicide by jumping from a height .. ..	..	..	..	..	..	..	..	..	..	..	..	..
173. Suicide by Crushing .. ..	..	..	..	..	..	..	..	..	..	..	..	..
174. Other Suicides .. ..	..	..	..	..	..	..	..	..	..	..	..	..
175. Food Poisoning— Botulism .. ..	..	..	..	1	..	1	..	..	..	35	16	16
176. Attacks of Poisonous Animals— Snake Bite .. ..	2	..	2	..	..	..	..	..	..	..	..	..
Insect Bite .. ..	..	..	..	3	4	7	9	..	..	40	8	48
177. Other Accidental Poisonings .. ..	..	..	..	..	3	3	25	..	..	121	35	156
178. Burns (by Fire) .. ..	3	..	3	1	..	4	..	..	..	4	2	6
179. Burns (other than by Fire) .. ..	1	..	1	2	..	2	11	..	..	1,137	543	1,680
180. Suffocation (Accidental) .. ..	..	..	..	..	..	..	..	..	..	402	178	580
181. Poisoning by Gas (Accidental) .. ..	..	..	..	..	..	..	..	..	..	..	..	..
182. Drowning (Accidental) .. ..	..	..	..	..	..	..	1	..	1	..	..	..
183. Wounds (by Firearms, War accepted) .. ..	..	..	..	..	..	..	1	..	1	2	..	2
184. Wounds (by Cutting or Stabbing Instruments) .. ..	2	..	2	1	..	1	48	..	..	2,894	767	3,661
185. Wounds (by Fall) .. ..	1	..	1	..	..	..	29	..	..	2,443	340	2,783
186. Wounds (in Mines or Quarries) .. ..	..	..	..	..	..	..	..	..	..	109	..	109
187. Wounds (by Machinery) .. ..	..	..	..	..	..	..	3	..	..	81	3	84
188. Wounds (Crushing, e.g., Railway Accidents, etc.) .. ..	..	..	..	1	..	1	..	..	..	..	..	..
189. Injuries inflicted by Animals, Bites, Kicks, etc. .. ..	2	..	2	3	1	4	3	..	..	526	134	660



## RETURN OF DISEASES—OUT-PATIENTS—(Contd.).

DISEASES	EUROPEAN OFFICIALS			EUROPEAN GENERAL POPULATION (NON-OFFICIAL)			NON-EUROPEAN OFFICIALS (including ASIATICS)			NATIVE GENERAL POPULATION (including ASIATICS)		
	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total
XIV.—AFFECTIONS PRODUCED BY EXTERNAL CAUSES—(Contd.).												
190. Wounds inflicted on Active Service	..	..	..	..	..	..	..	..	..	..	..	..
191. Executions of Civilians by Bel-ligerents ..	..	..	..	..	..	..	..	..	..	..	..	..
192. A.—Over Fatigue ..	..	..	..	..	..	..	..	..	..	..	..	..
B.—Hunger or Thirst ..	..	..	..	..	..	..	..	..	..	..	..	..
193. Exposure to Cold, Frostbite, etc.	..	..	..	..	..	..	..	..	..	..	..	..
194 Exposure to Heat—	..	..	..	..	..	..	..	..	..	..	..	..
Heatstroke ..	..	..	..	..	..	..	..	..	..	..	..	..
Sunstroke ..	..	..	..	..	..	..	..	..	..	..	..	..
195. Lightning Stroke..	..	..	..	..	..	..	..	..	..	..	..	..
196. Electric Shock ..	..	..	..	..	..	..	..	..	..	..	..	..
197. Murder by Firearms ..	..	..	..	..	..	..	..	..	..	..	..	..
198. Murder by Cutting or Stabbing	..	..	..	..	..	..	..	..	..	..	..	..
Instruments ..	..	..	..	..	..	..	..	..	..	..	..	..
199. Murder by other means ..	..	..	..	..	..	..	..	..	..	..	..	..
200. Infanticide (Murder of an Infant	..	..	..	..	..	..	..	..	..	..	..	..
under one year ..	..	..	..	..	..	..	..	..	..	..	..	..
201. A.—Dislocation ..	1	..	1	1	..	1	..	..	..	..	..	..
B.—Sprain ..	4	..	4	1	..	1	..	..	..	..	..	..
C.—Fracture ..	4	..	4	6	1	7	..	..	..	..	..	..
202. Other External Injuries ..	85	1	86	42	13	55	392	..	392	21,737	3,685	25,422
203. Deaths by Violence of unknown	..	..	..	7	2	9	..	..	..	..	..	..
cause ..	..	..	..	..	..	..	..	..	..	..	..	..
XV.—ILL DEFINED DISEASES.												
204. Sudden Death (cause unknown)	..	..	..	..	..	..	..	..	..	..	..	..
205. A.—Diseases not already specified	..	..	..	..	..	..	..	..	..	..	..	..
or ill-defined—	..	..	..	..	..	..	..	..	..	..	..	..
Ascites ..	4	..	4	..	2	2	5	..	5	182	47	229
Oedema ..	..	..	..	1	..	1	..	..	..	13	13	26
Asthenia ..	..	..	..	..	..	..	..	..	..	62	39	101
Shock ..	4	..	4	5	3	8	..	..	..	106	17	123
Hyperpyrexia ..	..	..	..	..	..	..	3	..	3	..	..	..
P.U.O. ..	3	..	3	1	1	2	153	..	153	4,131	1,392	5,523
Debility ..	2	..	2	1	2	3	..	..	..	58	56	114
Malnutrition ..	..	..	..	..	..	..	..	..	..	..	12	12
Ludwig's angina ..	..	..	..	..	..	..	..	..	..	1	1	1
Migraine ..	..	..	..	..	..	..	..	..	..	5	..	5
Human bite ..	..	..	..	..	..	..	2	..	2	6	..	6
N.Y.D. ..	..	..	..	..	..	..	..	..	..	9	..	9
Marasmus ..	..	..	..	..	..	..	..	..	..	2	..	2
B.—Malingering ..	..	..	..	..	..	..	..	..	..	75	..	75

RETURN OF DISEASES—OUT-PATIENTS—(Contd.).

DISEASES	EUROPEAN OFFICIALS			EUROPEAN GENERAL POPULATION (NON-OFFICIAL)			NON-EUROPEAN OFFICIALS (including ASIATICS)			NATIVE GENERAL POPULATION (including ASIATICS)		
	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total
XVI.—DISEASES, THE TOTAL OF WHICH HAVE NOT CAUSED 10 DEATHS.	..	..	..	..	..	..	..	..	..	..	..	..
	501	8	509	498	320	818	4,938	..	4,938	217,313	78,026	295,339
GRAND TOTAL	..											
SURGICAL OPERATIONS—												
Under General Anæsthesia	..	..	..	..	..	..	..	..	..	..	..	..
Others	..	..	..	..	..	..	..	..	..	..	..	..





MEDICAL RESEARCH LABORATORY  
ANNUAL REPORT, 1933

By

R. P. CORMACK, M.B.; CH.B., D.P.H., D.T.M. & H

*Senior Bacteriologist*





# CONTENTS

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	PAGE
A.—ADMINISTRATIVE SECTION .. .. .	1
B.—SECTION OF MEDICAL BIOLOGY AND SEROLOGY .. ..	3
C.—CALF LYMPH SECTION .. .. .	6
D.—PATHOLOGICAL SECTION .. .. .	10
E.—BACTERIOLOGICAL SECTION .. .. .	12
F.—SECTION OF ENTOMOLOGY .. .. .	16
G.—BIOCHEMICAL SECTION .. .. .	19
APPENDIX.—Résumé of Work Carried out at the Clinical Laboratory attached to the Native Civil Hospital, Mombasa .. .. .	20

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# ANNUAL REPORT OF THE MEDICAL RESEARCH LABORATORY, KENYA COLONY AND PROTECTORATE, FOR 1933.

## 1.—Staff, 1933.

Deputy Director of Laboratory Services	...	...	1
Senior Bacteriologist	...	...	1
Assistant Bacteriologists	...	...	3
Government Analyst	...	...	1
Biochemist	...	...	1
Medical Entomologists	...	...	2
Laboratory Superintendent	...	...	1
Laboratory Assistants (Senior Grade)	...	...	6
Laboratory Assistants (Junior Grade)	...	...	3
Laboratory Assistants (Non-European)	...	...	4
Malarial Field Overseers (1 new post)	...	...	2
Tsetse Field Overseer (new post)...	...	...	1
Librarian and Stenographer	...	...	1
Storekeeper	...	...	1

On 9th March, upon his promotion to the post of Director of Medical and Sanitary Services, Uganda, Dr. W. H. Kauntze, Deputy Director of Laboratory Services, Kenya, severed his long connection with the Laboratory. He had held the latter post under different titles since 7th January, 1919, and had seen and been responsible for all the changes in function and personnel during that time. In the Annual Report for last year, he gave a summary of the events in the history of the Laboratory which had taken place during that period.

Since his departure, the post of Deputy Director of Laboratory Services has remained unfilled. The duties of that position were carried on by Capt. R. P. Cormack until 12th May, when he went on leave; thereafter by Dr. F. P. G. de Smidt, Assistant Bacteriologist, until the return of Capt. Cormack on 24th December, when the latter resumed duty.

On 31st March, the services of Mr. L. Burton were lost to the Laboratory upon his transfer to the Agricultural Department. His post was not filled.

The rest of the staff, both non-African and African, remained the same as in the previous year, with the exception of the additions noted above.

## 2.—Buildings.

Apart from the erection of sheds behind the quarters of the native staff to store forage for the animals and camping equipment, etc., there have been no additions or alterations in the buildings. The ground has been cleared fairly well and a few trees planted, but owing to the long continued drought, they have not thriven very well.

Two rooms which were intended to house a team of research workers appointed to the Laboratory for the purpose of carrying out some particular piece of research were lent to the Geological Section of the Mines Department who have occupied them throughout the year and still do so. It is expected that they will be given up soon and that such a team will be able to make use of them.

## 3.—Library.

No text books have been added to the Library during the year on account of the need for economy. This section of the Library is very defective as in the past the amount of money allotted to this purpose has not been enough. Text books are expensive and are becoming more exclusive in the subjects with which they deal so that in order to keep reasonably up to date a larger number of books needs to be bought.

The journal section of the Library is reasonably well covered, with the help of exchanges with the Veterinary Research Laboratory at Kabete. There is, however, a great and very troublesome delay in the binding of complete journals owing to the inability of the Government Printer to cope with the amount of work.

4.—Finance.

The cost incurred on behalf of the Laboratory for the items noted is as follows :—

Staff Emoluments	... ..	£13,837
Medical and Surgical Stores and Upkeep	...	1,651
<i>Total</i> ...		<u>£15,488</u>

No account has been taken of the cuts in salary imposed by the recent economy measures, which amount roughly to 5 per cent of the above sums paid in emoluments.

The cost of the various products of the Laboratory calculated as in the previous Annual Report, and fees collected are :—

	Amount	£
Calf Lymph Issued for Use .. ..	89,757 doses	1,684
T.A.B. Vaccine Issued for Use ..	4,200 c.c.	320
T.A.B. Vaccine Placed to Stock ..	3,394 „	204
Plague Vaccine Issued for Use ..	30,200 „	2,265
Plague Vaccine Placed to Stock ..	186,755 „	14,006
Rabies Vaccine Issued for Use ..	6,880 „	516
Rabies Vaccine Placed to Stock ..	3,440 „	258
Various Vaccines—Autogenous ..	143 sets	715
Various Vaccines—Stock .. ..	1,676 c.c.	83
Bismuth or Bismuth Oxide Issued for Use	217,560 doses	2,330
Fees Collected in Cash .. ..	.. ..	1,520
<i>TOTAL</i> ..		<u>£ 28,901</u>

Fresh local strains, from which the vaccines are prepared, are continually being added or substituted, so that in that respect at least the vaccines are more suitable for use in the country than any others which could be obtained from abroad. It is, of course, essential to maintain adequate stocks against the possible sudden outbreak of epidemic disease. There is and must always be a certain and unavoidable wastage on this account if one wishes to keep the stock as fresh as possible, but by using certain modern facilities such as low temperature storage, along with arrangements for rapid expansion of manufacture if need should arise this is minimised.

5.—General.

The routine work of the laboratory has followed the usual lines of previous years. It is, as is natural, continually expanding in volume. The reduction by one in the number of the staff of Medical Officers is severely felt and it is now impossible to spare an officer to attend at the European Hospital at a fixed hour daily. The same applies in the case of the Native Civil Hospital : visits are at irregular times, which militates against good and continuous work.

A certain small amount of research work has been carried on as is detailed in the reports of sections. Routine work occupies practically the whole time of most of the officers and very little time, and that at irregular intervals, is available for anything else.

The Government Analyst is still part of the organization of the Medical Research Laboratory but as his work as a whole is not of medical interest it is not considered fit to include a report of it in this Annual Report.



### 6.—Publications by the Staff.

J. I. Roberts and H. D. Tonking :

“A Preliminary Note on the Vector of Tropical Typhus in Kenya.”  
(East African Medical Journal, Vol. IX, p. 310).

H. C. Trowell and F. P. G. de Smidt :

“Observations on Dysentery in Nairobi.”  
(East African Medical Journal, Vol. X, p. 265.)

## B.—SECTION OF MEDICAL BIOLOGY AND SEROLOGY.

### 1.—Staff.

The section was taken over in March by Dr. H. D. Tonking, who relieved the Senior Bacteriologist, who in turn assumed charge of the Laboratory on the departure of Dr. Kauntze for Uganda.

### 2.—Serology.

The total number of specimens of sera received for examination showed a marked increase on the previous year. The main increase was in sera for the Kahn reaction. The number was 2,486 which is an increase of 518 on that of 1932.

The routine tests employed were the Kahn and the Wassermann. The Kahn was used for all sera, and the Wassermann for the examination of cerebro-spinal fluids and as a check on the Kahn for a number of sera taken more or less at random. Usually, the Wassermann test was performed about once a month. These two tests are in use in all the East African territories and thus useful data will in time be obtainable—which was not previously the case owing to the many different tests used in the various laboratories.

The results of the two tests showed a most gratifying agreement and the Medical Officers are now losing their early doubts as to the accuracy of the Kahn. Rarely is a serum now received with a specific request for the Wassermann reaction to be performed.

During the year there was a great improvement noted in the condition of the sera or bloods received. Only a very small percentage of the total sera was rejected for haemolysis or contamination.

Ampoules were used much more and were largely the cause of the improvement.

#### (a) *Kahn Results.*

Negative	...	...	...	...	...	...	1,171
Positive	...	...	...	...	...	...	1,454
Not sufficient serum	...	...	...	...	...	...	23
Contaminated or haemolysed sera	...	...	...	...	...	...	76
Doubtful readings	...	...	...	...	...	...	122
<i>Total</i> ...							2,846

(b) *Wassermann's Reaction* ... .. 201

#### (c) *Widal's Reaction.*

The number of sera received for Widal's reaction showed a decrease on the previous year, 224 having been sent as against 339.

The results were as follows :—

Europeans	...	...	58	negative	40
Asians	...	...	28	negative	18
Africans	...	...	138	negative	67

As was the case last year, 70 per cent of the organisms showing agglutination were *B. typhosus*. Sera showing agglutination of *B. paratyphosus A*, and *B. paratyphosus B* and *B. abortus* were met with, the latter in four African cases only. Nine Weil-Felix reactions were performed : all negative.

3.—Medical Biology.

All branches of the work showed an increase on last year's figures.

Observations on the diagnosis of chronic amoebic dysentery were carried out mainly at the European Hospital, Nairobi, and it was found that a single negative stool examination was useless in excluding the disease. Many cases did not show cysts until perhaps a dozen examinations had been made. All the work was carried out on perfectly fresh stools, at the Hospital. These findings would seem to indicate that the infection is much more common than was hitherto suspected. The work will be published elsewhere.

It has been found during the year that the presence of Charcot-Leyden crystals in the stools is a sure indication of *E. histolytica*, as all stools showing them sooner or later contained cysts or amoebae.

The presence of the eight nucleated cysts of *E. histolytica* were met with frequently during the year and appear to be a great deal more common than the text books lead one to suspect. All such findings were confirmed by the preparation of stained specimens.

The following table shows the results of the examinations during the year :—

(a) FAECES EXAMINATIONS (MICROSCOPICAL).

	Europeans	Asians	Africans	Total
Total Examined .. .. .	1,461	279	5,162	6,902
Negative .. .. .	1,176	148	1,418	2,742
Ova of—				
<i>Tænia</i> .. .. .	4	3	1,146	1,153
<i>A. lumbricoides</i> .. .. .	2	16	640	658
<i>A. duodenale</i> .. .. .	18	20	898	936
<i>S. mansoni</i> .. .. .	24	2	166	192
<i>E. vermicularis</i> .. .. .	1	—	24	25
<i>T. trichiura</i> .. .. .	35	29	695	759
<i>H. diminuta</i> .. .. .	—	—	3	3
<i>H. nana</i> .. .. .	—	—	11	11
<i>S. stercoralis</i> .. .. .	5	5	200	210
Larvæ of <i>S. stercoralis</i> .. .. .	—	4	225	240
Cysts and other Forms of—				
<i>E. coli</i> .. .. .	89	27	1,624	1,740
<i>E. histolytica</i> .. .. .	61	2	103	166
<i>I. butschlii</i> .. .. .	17	4	409	430
<i>G. intestinalis</i> .. .. .	34	4	72	110
<i>I. hominis</i> .. .. .	—	—	9	9
Undifferentiated Cysts and Flagellates ..	168	60	2,216	2,444
? <i>E. histolytica</i> .. .. .	6	1	—	7

The above table indicates how often each parasite was encountered, and no account has been taken of whether the infection was a single or a multiple one.

Urines for Ova *S. haematobium*—

	Negative	Positive
Europeans ...	17	—
Asians ...	2	—
Africans ...	5	1

(b) BLOOD EXAMINATIONS (MICROSCOPICAL).

(1) *Europeans.*

<i>P. falciparum</i> ...	73 (Crescents 2)
<i>P. vivax</i> ...	6
<i>P. malariae</i> ...	2
Differential counts ...	376
Total counts ...	20
Trypanosomes ...	1
Negative ...	665
Mixed infections ...	2
<hr/>	
Total ...	1,145
<hr/>	



(2) *Asians.*

<i>P. falciparum</i>	...	...	...	...	188	(Crescents 6)
<i>P. vivax</i>	...	...	...	...	26	
<i>P. malariae</i>	...	...	...	...	1	
Differential counts	...	...	...	...	16	
Total counts	...	...	...	...	11	
Mixed infections	...	...	...	...	5	
Negative	...	...	...	...	717	
<i>Total</i>					964	

(3) *Africans.*

<i>P. falciparum</i>	...	...	...	...	601	(Crescents 97)
<i>P. vivax</i>	...	...	...	...	25	
<i>P. malariae</i>	...	...	...	...	50	
<i>S. recurrentis</i>	...	...	...	...	7	
Unsheathed microfilariae	...	...	...	...	31	
Differential counts	...	...	...	...	6	
Total counts	...	...	...	...	71	
Mixed infections	...	...	...	...	6	
Negative	...	...	...	...	5,923	
<i>Total</i>					6,720	

(c) MISCELLANEOUS.

The following miscellaneous examinations were performed :—

Blood grouping for transfusion	...	...	10
Cell counts on cerebro-spinal fluids	...	...	15
Nasal scraping for Leishman Donovan bodies	...	...	1 (positive)
Spleen smear for Leishman Donovan bodies	...	...	2 (1 positive)

With regard to the latter finding, the case was one of Visceral Kala-azar in an African native who had never left his Reserve on the Elgayo Escarpment and was brought into Eldoret exhibiting typical symptoms of the disease. It is hoped that an investigation of the district will take place shortly.

(d) MEDICO-LEGAL.

During the year seventy-one exhibits were examined for the Police. Of these, fifty-eight were for the presence of human blood and thirteen for the detection of spermatozoa from suspected cases of rape.

This branch of serology has now been taken over by the Government Analyst which will relieve the section of Medical Biology considerably as many of the examinations for human blood involved several hours' work at the expense of other routine examinations. One particular batch of exhibits involved the performance of no less than a hundred separate precipitin reactions.

Work was started during the year on experiments on the ascertaining of the blood group of blood stains, using sera from known groups for diagnosis. It is hoped that this work will be advanced enough at the end of 1934 to make a preliminary report. Although not as yet accepted as evidence in the English courts, there seems to be a possibility of its adoption in the near future. The test is of the greatest use in cases in which blood found on the garments of an accused person is stated by him to be his own and not that of the victim. In such a case, if the stains are not of the same group as that of the accused and are of the same group as that of the deceased, then there is some circumstantial evidence of guilt.



**C.—CALF LYMPH SECTION.****1.—Staff.**

Owing to changes of staff throughout the year, various officers had charge of this section.

**2.—Production of Calf Lymph.**

The system of frequent rabbit passage has been continued and a very vigorous lymph is being produced. An increase both in production and issue is shown, while as before, other countries took considerably more lymph than did Kenya. The revenue brought in by these sales approximately pays for the cost of lymph consumed in Kenya.

**3.—Summary of Calf Lymph Production during 1933.**

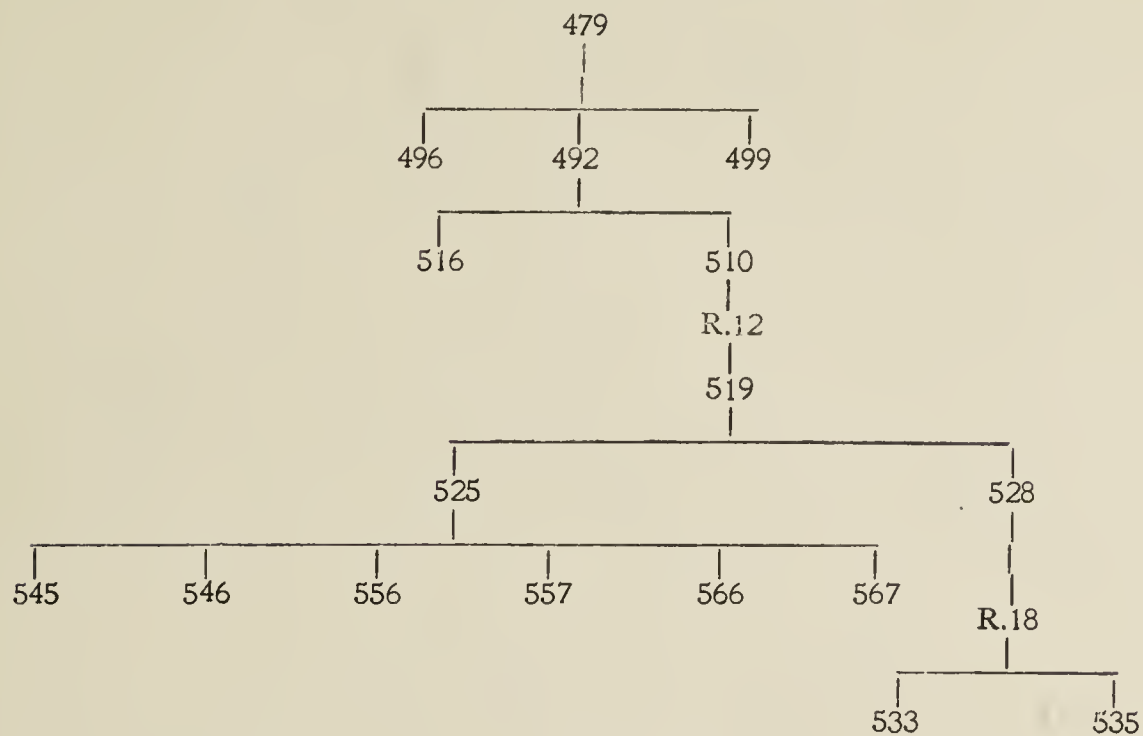
Total number of calves received	...	...	...	83
Total number of calves from which lymph was collected	...	...	...	76
Total number of grammes of pulp	...	...	...	974
Average yield per calf in grammes	...	...	...	12.816
Number of doses remaining on hand on 31-12-32...	262,215			
Number of doses manufactured during 1933	...	292,200		
Number of doses issued during 1933	...	...	283,366	
Number of doses used for inoculation of calves, etc.	15,989			
Number of doses remaining on hand on 31-12-33...	255,060			
Cost of calves	...	...	...	Sh. 1,230

**4.—List of Stations and Amount of Calf Lymph supplied in 1933.**

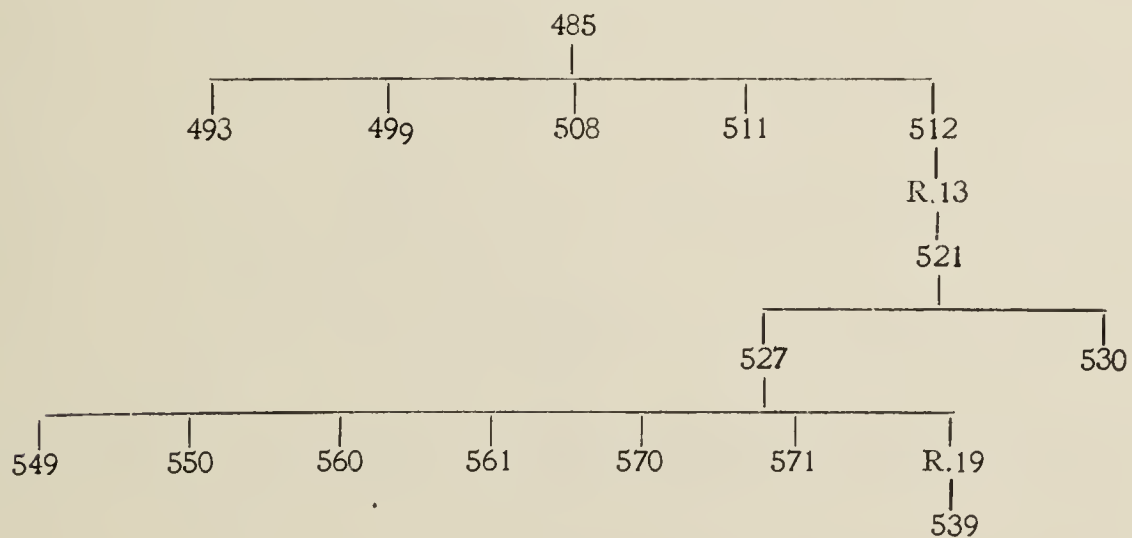
<i>Station</i>						<i>Doses</i>
Mombasa	...	...	...	...	...	25,368
Lamu	...	...	...	...	...	2,450
Malindi	...	...	...	...	...	600
Voi	...	...	...	...	...	5,100
Machakos	...	...	...	...	...	1,143
Kitui	...	...	...	...	...	2,070
Fort Hall	...	...	...	...	...	520
Nyeri	...	...	...	...	...	250
Meru	...	...	...	...	...	2,300
Nakuru	...	...	...	...	...	7,355
Eldoret	...	...	...	...	...	843
Kitale	...	...	...	...	...	132
Kapsabet	...	...	...	...	...	600
Kisii	...	...	...	...	...	6,750
Kisumu	...	...	...	...	...	4,000
Kakamega	...	...	...	...	...	23,100
Kericho	...	...	...	...	...	700
Wesu-Teita	...	...	...	...	...	2,024
Moyale	...	...	...	...	...	1,500
Miscellaneous	...	...	...	...	...	2,952
<i>Total</i> ...						89,757
<i>Kenya</i>	...	...	...	...	...	89,575
<i>Uganda</i>	...	...	...	...	...	113,199
<i>Italian Somaliland</i>	...	...	...	...	...	80,110
<i>Rhodesia</i>	...	...	...	...	...	300
<i>Total</i> ...						283,366

## 5.—Tables showing the History of each Calf Lymph Strain.

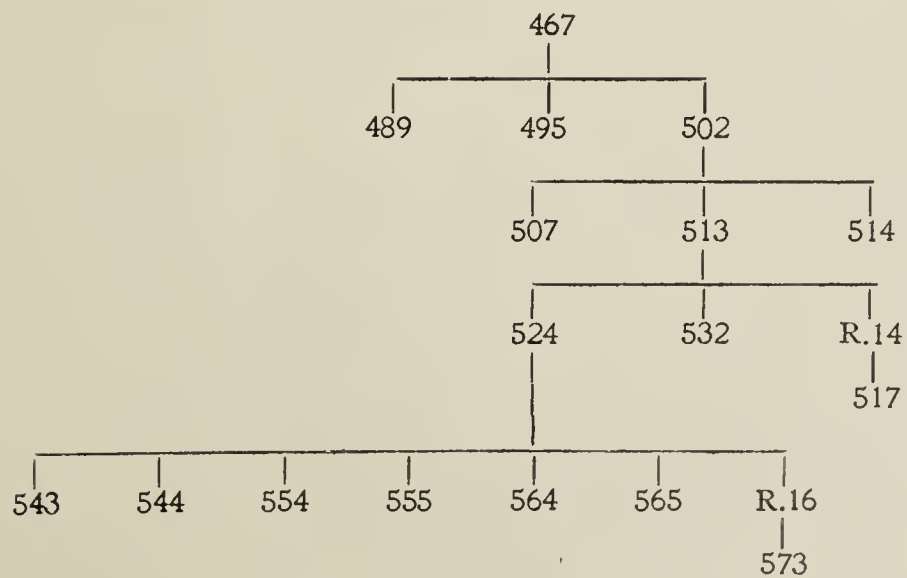
## SOUTH AFRICAN STRAIN—1933.



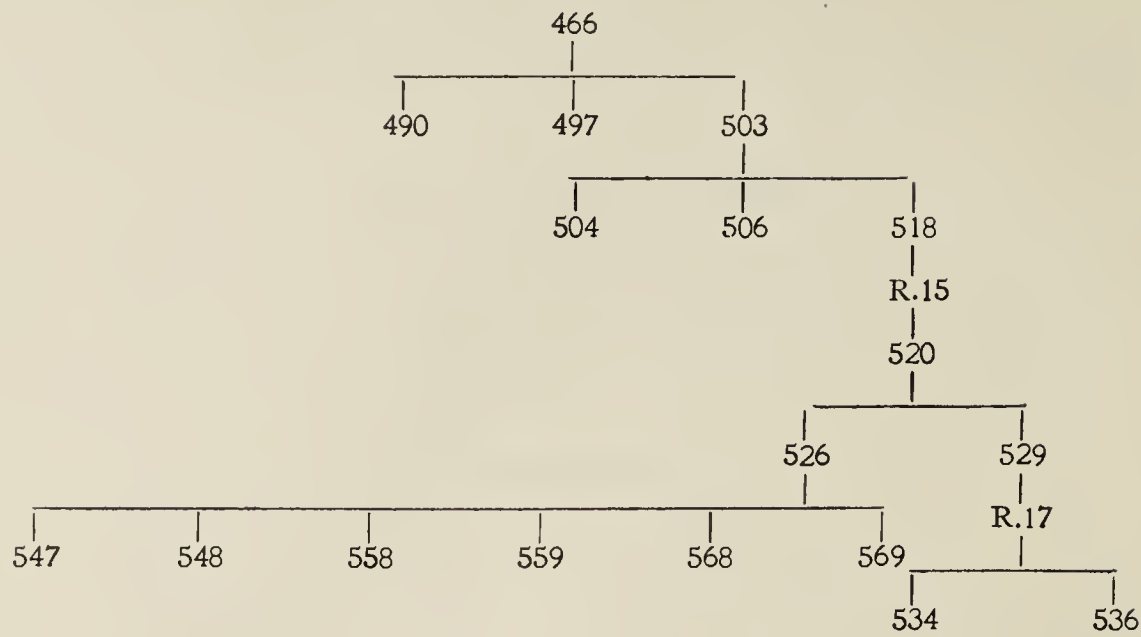
## ZANZIBAR STRAIN—1933



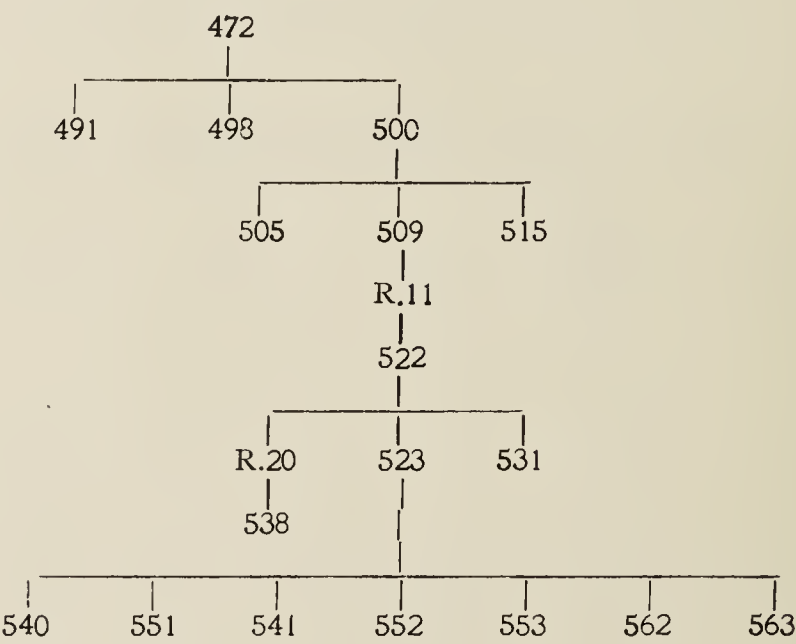
## PARIS STRAIN—1933.



BÆDANG STRAIN—1933.



BELGAUM STRAIN—1933.





VACCINATION RETURN, 1933

Residence	No. of Persons Vaccin- ated	Sex		Primary				Re-vaccinations				Previous Condition Unknown			
		Male	Female	Total	Success- ful	Failed	Un- known	Total	Success- ful	Failed	Un- known	Total	Success- ful	Failed	Un- known
Mombasa	4	4	..	4	3	..	1	..	..	..	..	..	..	..	..
Lamu ..	166	148	18	119	16	..	103	42	..	..	42	..	..	..	5
Malindi..	111	104	7	111	8	1	102	..	..	..	..	..	..	..	..
Muriranjias	1	1	..	1	1	..	..	..	..	..	..	..	..	..	..
Voi ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Kitui ..	564	560	4	333	1	1	331	228	..	..	228	..	..	..	3
Machakos	167	163	4	77	48	25	4	90	16	66	8	..	..	..	..
Fort Hall	167	166	1	167	94	72	1	..	..	..	..	..	..	..	..
Nyeri ..	193	192	1	62	38	24	..	131	53	78	..	..	..	..	..
Meru ..	19	19	..	16	4	12	..	3	2	1	..	..	..	..	..
Kapenguria	59	59	..	59	..	..	59	..	..	..	..	..	..	..	..
Nakuru	375	373	2	287	285	..	2	21	21	..	..	67	..	..	67
Eldoret ..	486	442	44	425	297	73	55	..	..	..	..	61	..	..	61
Kapsabet	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Kakamega	2,300	2,300	..	418	211	..	207	1,498	359	457	682	384	..	..	384
Kisii ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Kericho	185	185	..	185	89	21	75	..	..	..	..	..	..	..	..
Kisumu	5,445	5,444	1	307	127	99	81	475	157	159	159	4,663	..	..	4,663
Wesu-Teita	13	13	..	8	3	5	..	5	..	5	..	..	..	..	..
Moyale ..	1,010	525	485	822	720	82	20	188	..	..	188	..	..	..	..
Lodwar	80	80	..	..	..	..	..	..	..	..	..	80	69	10	1
Kilifi ..	1	..	1	1	1	..	..	..	..	..	..	..	..	..	..
Nairobi	1,016	973	43	127	82	29	16	786	48	661	77	103	..	..	103
Total	12,362	11,751	611	3,529	2,028	444	1,057	3,467	656	1,427	1,384	5,366	69	10	5,287

It will be noticed in the foregoing table how extraordinarily poor are the returns in some cases. In one case, allowing even a 60 per cent wastage of lymph, only 0.04 per cent of inoculation results were returned; a figure which might surely be increased a thousandfold if a little trouble were taken.

Another feature to which attention is directed is the apparently high failure rate of the lymph in primary vaccinations. There are two reasons for this. First, it is unavoidable at times that the lymph in a country such as this is, should be exposed to conditions which very strongly diminish its potency. Secondly, and this is, it is thought, the more important factor; it is very often impossible to tell whether or not the inoculation is truly a primary one. And besides, where smallpox has been a fairly common endemic disease, the likelihood of a transmitted immunity from the mother to the offspring is higher than it would otherwise be.

When the lymph is subjected to test on carefully selected cases whose antecedents are known, it is found uniformly to be potent, even in spite of inimical conditions of not too long duration or degree. For instance, lymph kept at the Coast for three weeks without any special precautions other than putting it in a drawer or cupboard was found to give uniformly successful results in a small batch of cases.

D.—PATHOLOGICAL SECTION.

1.—Post-mortem Examinations.

During the year 141 post-mortem examinations were carried out at the request of the different authorities :—

NATIVE CIVIL HOSPITAL .. .. .	55
POLICE  .. .. .	36
INFECTIOUS DISEASES HOSPITAL .. .. .	25
MUNICIPALITY .. .. .	12
OTHER AUTHORITIES .. .. .	13
TOTAL .. .. .	141

EUROPEAN—

Cancer—Stomach .. .. .	1
Encephalitis lethargica .. .. .	1
Fractured skull .. .. .	3
Gun-shot wounds .. .. .	3
TOTAL EUROPEAN .. .. .	8

ASIATIC—

Burns .. .. .	1
Dislocation, first cervical vertebra .. .. .	1
Fractured skull .. .. .	1
Gun-shot wound .. .. .	1
Poisoning, arsenical .. .. .	1
Ruptured thoracic aneurysm .. .. .	1
TOTAL ASIATIC .. .. .	6

AFRICAN—

Abscess, cerebral .. .. .	2	}	2
„ subphrenic .. .. .	1		
Aneurysm, thoracic rupture of .. .. .	1		
Carcinoma, liver .. .. .	2	}	3
„ large intestine .. .. .	1		
Cirrhosis of liver .. .. .	2		
Diabetes .. .. .	2		
Dysentery (bacillary) .. .. .	2		
Encephalitis lethargica .. .. .	1		
Gastro-enteritis .. .. .	1		
Intestinal obstruction .. .. .	1		
Malaria .. .. .	3	}	4
„ cerebral .. .. .	1		
Myocarditis .. .. .	6	}	8
„ and valvular disease .. .. .	2		
Nephritis, interstitial .. .. .	2	}	10
„ parenchymatous .. .. .	4		
„ and pyonephrosis .. .. .	4		
Peritonitis, ruptured pyosalpinx .. .. .	1		
„ ruptured uterus .. .. .	1		

AFRICAN—(*contd.*)

Pneumonia	..	..	..	..	..	25	} 32
„ and meningitis	..	..	..	..	..	5	
„ and pericarditis	..	..	..	..	..	1	
„ meningitis and pericarditis	..	..	..	..	..	1	
„ broncho-	..	..	..	..	..	..	3
Poisoning	..	..	..	..	..	..	4
Pulmonary œdema	..	..	..	..	..	..	1
„ infarct	..	..	..	..	..	..	1
Sarcoma, tonsil	..	..	..	..	..	..	1
Septicæmia	..	..	..	..	..	..	9
Tuberculosis, pulmonary	..	..	..	..	..	14	} 19
„ intestines and peritoneum	..	..	..	..	..	3	
„ and meningitis	..	..	..	..	..	2	
Violence, electrocution..	..	..	..	..	..	1	} 18
„ fracture of skull	..	..	..	..	..	10	
„ fracture of spine	..	..	..	..	..	2	
„ hæmorrhage from wounds	..	..	..	..	..	3	
„ ruptured spleen	..	..	..	..	..	1	
„ suffocation	..	..	..	..	..	1	
TOTAL AFRICAN						..	127
GRAND TOTAL						..	141

## 2.—Histological Examinations.

The total number of examinations carried out during the year was 553 :—

## EUROPEAN—

Tumours, benign	..	..	..	..	..	27	} 38
„ malignant	..	..	..	..	..	11	
Inflammatory	..	..	..	..	..	..	25
T. B.	..	..	..	..	..	..	1
Fatty degeneration	..	..	..	..	..	..	1
Normal tissue	..	..	..	..	..	..	1
TOTAL EUROPEAN						..	66

## ASIATIC—

Tumours, benign	..	..	..	..	..	1	} 2
„ malignant	..	..	..	..	..	1	
TOTAL ASIATIC						..	2

## AFRICANS—

Tumours, benign :							
Adenoma	..	..	..	..	..	..	10
Cysts	..	..	..	..	..	..	8
Epulis	..	..	..	..	..	..	1
Fibroma	..	..	..	..	..	..	3
Hæmangioma	..	..	..	..	..	..	3
Lipoma	..	..	..	..	..	..	1
Lymphangioma	..	..	..	..	..	..	1
Neurofibroma	..	..	..	..	..	..	1
Osteoma	..	..	..	..	..	..	1
Tumours, malignant :							
Carcinoma	..	..	..	..	..	..	30
Endothelioma	..	..	..	..	..	..	4
Epithelioma	..	..	..	..	..	..	23
Melanoma	..	..	..	..	..	..	4
Mixed tumour of parotid	..	..	..	..	..	..	2
Myeloma	..	..	..	..	..	..	1
Sarcoma	..	..	..	..	..	..	15
Teratoma	..	..	..	..	..	..	6
Tumours, inflammatory, -of which 28 were tubercular							.. 335
Cirrhosis of liver	..	..	..	..	..	..	10
Degenerations	..	..	..	..	..	..	6
Hodgkin's disease	..	..	..	..	..	..	1
Normal tissue	..	..	..	..	..	..	12
TOTAL AFRICAN						..	478
ANIMAL TISSUES						..	7
GRAND TOTAL						..	553

During the year research was continued on the brain of the East African native and on Tropical Ulcers. This work is not included in the above examinations.



**E.—BACTERIOLOGICAL SECTION.****1.—Routine Examinations.**

The number of specimens received for examination during the year total 3,035 and are divisible into :—

Specimens for microscopical examination...	...	1,994
Specimens for cultural examination	... ..	1,041

The more important findings among these are tabulated below :—

(a) *Anthrax*.—No cases or specimens received for examination.

(b) *Diphtheria*.—Positive examinations of throat swabs : 11.

(c) *Dysentery*.—From 125 specimens of stool examined for bacillary dysentery, dysenteric bacteria were recovered as represented below :—

1. *Flexner Group* : 28 cases.
2. *Bacillus of Shiga* : 10 cases.
3. *Bacillus of Sonn * : 3 cases.
4. *Bacillus of Schmitz* : 2 cases.
5. “*Shigella B*” : 10 cases.

“*Shigella B*” is the sorbite-fermenting Flexner-like organism which has previously been reported as under investigation.

In regard to *Bacillus of Shiga*, this was isolated from the stool of an Indian boy in June, the patient having recently arrived from Bombay and having sickened with dysentery during the voyage. The remaining nine cases were among Africans in Nairobi district during the latter part of the year. This is the first year in which the Shiga bacillus can be found to have been recorded as isolated in this laboratory.

(d) *Typhoid*.—*B. typhosus* was recovered from one specimen of stool, and from an abscess on the head of a typhoid patient. *Bacillus No. 1 of Morgan* (*Salmonella morgani*) was recovered from ten specimens of stool.

*Paratyphoid*.—No positive cultures obtained.

(e) *Undulant Fevers*.—No positive cultures obtained of any type of *Brucella*.

(f) *Leprosy*.—*B. lepra* was found in the nasal discharge of fourteen African cases.

(g) *Tuberculosis*.—*Tubercle bacilli* were found present in three specimens of pus and other exudate not sputum.

*Sputum examinations*.—A total of 1,169 examinations yielded 163 positive results.

(h) *Gonorrhoea*.—Examinations of urethral exudate were positive in 146 cases, mostly African.

(i) *Conjunctivitis*.—Five cases yielded gonococci, in one of which Koch-Weeks bacilli were present as well. Eight cases showed Koch-Weeks bacilli, including that in which gonococci were also present. Two cases exhibited bacilli of Morax only.

(j) *Plague*.—No positive examinations either in rats or man are recorded for the year, plague having been absent from the Nairobi district and comparatively little in evidence elsewhere in the Colony.

(k) *Acute Meningitis*.—A few cerebro-spinal fluids were received from such cases in the Native Hospital, Nairobi, and one (pneumococcus Type 1) from an Indian. Only one yielded meningococci, the remainder being pneumococcal; a note on these appears in the section dealing with research on pneumonia.

## 2.—Vaccine Preparation.

(a) *Autogenous Vaccines*.—A total of 143 was prepared for treatment of individual patients; of these, eighty were of the “agglutinating coliform” type mainly for rheumatic cases, and thirty-five were for catarrhal conditions.

(b) *Stock Vaccines*.—These were prepared and maintained, comprising *Anti-catarrhal*, *staphylococcal*, *streptococcal*, *gonococcal*, *B. acnes*, and also vaccines for prophylaxis of *Typhoid-paratyphoid*, *plague*, and *rabies*.

(c) *Typhoid-paratyphoid Vaccine*.—7,594 doses prepared. 4,200 doses issued. The broth-culture type of “T.A.B.” vaccine was abandoned in the latter half of the year in favour of the R.A.M.C. method, using Kenya strains of *B. typhosus*. 3,394 doses have been prepared by the latter method.

(d) *Plague Vaccine*.—A total of 225,000 doses was made, of which 38,245 were issued to the Colony and also to Uganda. Notes on experimental work with plague vaccine appear in the section dealing with research.

(e) *Anti-rabic Vaccine*.—Sufficient carbolised vaccine for 125 full courses of treatment was prepared, and eighty courses of treatment were issued to the local treatment centres at Kericho, Kisumu, Nakuru, Kitale, Kisii and Eldoret. The strength of the vaccine ordinarily issued was increased to 2.5 per cent during the year, vaccine of 5 per cent strength being also maintained as usual in case of need for special use. It was hoped to replace the Kasauli virus used for vaccine by the Paris virus now employed by preference at the Kasauli Institute; but unfortunately the several specimens of Paris virus sent up to date from Kasauli to this Laboratory have arrived in an inactive state.

## 3.—Vaccine Treatments.

Patients to the number of 49 suffering from such complaints as rheumatism, catarrhal and septic infections have been treated in the Bacteriological Section; only 8 persons have applied for and been given treatment for protection against rabies, the affected areas being at a great distance from Nairobi.

## 4.—Water Analyses.

A total of 26 samples of water was dealt with: some of these were for checking the efficiency of chlorination systems in Nairobi and other chief centres, and some for estimating by means of the methyl-red and Koser tests the proportion of faecal and other types of *B. coli* class of bacteria in certain country supplies.

## 5.—Research.

(a) *Pneumonia*.—By the invaluable help of Drs. Trowell, Carman, and later of Dr. Philip, in supplying specimens with notes from lobar pneumonia cases in the Nairobi Native Hospital, and also Dr. Vint with specimens of post-mortem lung, etc., it has been possible to type a further considerable series of cases. A detailed type-analysis of these appears below in Table C. The total series of cases typed, from which the pneumococci were isolated, 462 in number, and dating from the end of 1929, are divisible as in Table A.

TABLE A  
PNEUMOCOCCUS

Type I	Type II	Type III	Group IV
13.8 per cent	5.7 per cent	5.7 per cent	74.8 per cent

Taking for convenience the continuous series of 228 cases, in Africans mainly, which yielded pneumococci, examined since 24th August, 1932, when work was resumed after overseas leave, we can divide them thus:—

TABLE B  
PNEUMOCOCCUS

Type I	Type II	Type III	Group IV
17.2 per cent	7.9 per cent	7.5 per cent	67.4 per cent



Six cases of pneumococcal meningitis, further mentioned below, are included. In addition, there were fourteen cases which yielded a pure culture of bile-insoluble streptococci virulent to mice, two which gave bacillus of Friedlander and one yielding pure mouse-heart culture of *Neisseria catarrhalis*.

The serological analysis of the Group IV pneumococci has been continued by preparing specific agglutinating type sera, the series up to date running alphabetically from A to Q, with the Kenya prefix Kw. Of these, Kw.A, Kw.E and Kw.H correspond to the standard types 1, 2 and 3 respectively, the remainder being completely distinct types of Group IV pneumococci. The Group IV cultures, 153 in number, collected from separate cases of lobar pneumonia of the series, are sub-divisible into types as in Table C, which gives their relative incidence in continuation of Table B.

TABLE C  
GROUP IV.—PNEUMOCOCCI

Type	..	Kw.B	-C	-D	-F	-G	-I	-J	-K	-L	-M	-N	-O	-P	-Q
Per cent	..	2.2	3.5	7.9	1.3	0.4	1.3	7.0	2.2	9.3	5.3	2.2	3.5	1.3	0.8

Unclassified 18.9 per cent

The types Kw.D, Kw.J, Kw.L, and to a lesser degree Kw.M, are of interest in that individually they numerically equal or outweigh types 2 and 3, while the types Kw.D, Kw.J and Kw.L collectively comprise 24 per cent of the total pneumococci and therefore preponderate in their incidence over Type 1. Each, especially type Kw.L and Kw.D, has been recovered repeatedly from post-mortem consolidated lung, and they are evidently fairly comparable with the standard types 1, 2 and 3 in their power to cause severe attacks of lobar pneumonia.

Table D shows a series of 181 consecutive cases in categories according to degree of severity of the pneumonia and the type of pneumococcus concerned.

TABLE D

Pneumococcus Type				Mild Cases	Moderately Severe	Severe and Fatal
I	..	..	..	3	8	27
II	..	..	..	1	6	12
III	..	..	..	1	1	13
Kw. B	..	..	..	1	1	2
Kw. C	..	..	..	3	2	2
Kw. D	..	..	..	6	6	6
Kw. F	..	..	..	—	—	3
Kw. G	..	..	..	—	—	1
Kw. I	..	..	..	2	—	2
Kw. J	..	..	..	1	9	7
Kw. K	..	..	..	1	1	3
Kw. L	..	..	..	2	5	14
Kw. M	..	..	..	—	4	6
Kw. N	..	..	..	1	3	1
Kw. O	..	..	..	1	2	6
Kw. P	..	..	..	1	1	1
Kw. Q	..	..	..	—	1	1
TOTAL..				24	50	107

The table includes the six cases of meningitis, four of which yielded Type 1, one Type 3, and one the Group IV type Kw.O.

By courtesy of Dr. Carman, the following figures for case-mortality are available for 1933 :—

Total	...	...	...	...	...	21.4 per cent.
For Group IV, infections only	...	...	...	...	...	16.4 per cent.



The Type 3 cases in natives are characteristically fulminant, the sputum often suggesting pneumonic plague by its appearance, and death may occur in about forty-eight hours with the lung as yet in the stage of acute congestion and yielding abundant pure growth of Type 3 cocci. Cases where *B. mucosus capsulatus* (Friedlander) is concerned are sometimes similar. Type 1 was recovered from the merely congested lung of an African who died in about two days with signs suggesting plague; and a native woman whose thin, haemorrhagic sputum yielded only the Group IV Type Kw.D, was also suspected on clinical grounds of pneumonic plague but during convalescence her sputum, then muco-purulent, yielded the same type, the only pneumococcus obtained from it by mouse culture.

(b) *Note on Technique.*—Much experience has been gained during the past sixteen months of the method devised in 1931 for the use of saline suspensions of surface cultures of pneumococci on blood-agar for serological work, including preparation of specific type sera as well as the typing of cultures. Such suspensions are very strongly specific, and when preserved with formalin they keep their specific anti-genic properties unimpaired for an indefinitely long period. The pneumococcus cultures which fail to respond to any of the type-sera in hand are kept as killed formalinised suspensions to be tested by sera subsequently prepared, and thus the laborious and uncertain business of maintaining a collection of living pneumococcus cultures in their specific *S* state is avoided.

The use of sputum for typing purposes has been criticized; but while it is the only reliable way of obtaining cultures from living pneumonia cases, it is also the only practicable method in the circumstances. Dr. Griffiths, Ministry of Health Laboratory, has kindly given his opinion that heart-cultures from mice inoculated with sputum generally yield the causative type, with the occasional exception in his experience of Type 3, as a virulent adventitious inhabitant of the upper respiratory passages. We feel there is sufficient reason to believe that while heart-cultures of mice inoculated with satisfactory specimens of sputum almost invariably yield only the causative type of pneumococcus, yet this is occasionally mixed with other bacteria equally virulent to mice. Type 3 was so recovered in one instance in small proportion mixed with a Group IV Type; it was also obtained in almost pure growth from two European cases of nasal and bronchial catarrh. Agglutination tests of collective or mass culture of pneumococci as derived from the mouse's heart have always shown when positive that complete degree of agglutination which indicates pure type culture. Agglutinating type sera are, however, made with suspension of culture derived from a single well-isolated colony.

(c) *Treatment of Pneumonia by Autogenous Vaccines.*—A method, detailed elsewhere, was devised and lately improved, by which autogenous pneumococcus vaccine can easily be made ready for use on the morning following the receipt of a specimen of sputum from a pneumonia patient, thus securing the necessary advantage of giving the initial dose at an early stage of the disease. It is believed that past failures with such vaccine are largely attributable to employing too small dosage. Considering the feeble toxicity of killed pneumococcus suspension, rabbits tolerating easily such large intravenous doses as 8.0 milligrams repeated on consecutive days, and that specific capsular substance represents much less than half of a given bulk of pneumococci, it seemed logical to try much larger subcutaneous doses than have been advised in the past. Native cases, unfortunately, are generally received in hospital in a too advanced stage of pneumonia for satisfactory tests of vaccine treatment. But two early European cases, one yielding the type Kw.D, the other Type 2, have so far been treated by the method with results so satisfactory as to encourage further trials.

(d) *Plague.*—Experimental work has been done to compare Haffkine broth vaccine cultivated at the temperature of 37 deg. C. with that incubated at the Nairobi standard temperature of 30 deg. It is hoped to profit by the

findings of H. Schutze that the "envelope substance" of plague bacilli constitutes the specific immunizing antigen, that this develops more abundantly at the higher temperature of incubation, and that vaccine cultivated at 37 degrees possesses greater immunizing properties while being of lower toxicity than that cultivated at 26 degrees—this being about the temperature at which Haffkine vaccine is produced in Bombay. The results of the six tests carried out, with 195 white rats, appear below, expressed as percentage survivals of vaccinated animals from test doses of plague, corrected for total mortality of non-vaccinated controls; the dose of vaccine used being 0.3 c.c.

		37 deg. Vaccine	30 deg. Vaccine
Exp.	I ...	87.5 per cent	87.5 per cent
Exp.	II ...	50 per cent	
Exp.	III ...	90.3 per cent	
Exp.	IV ...	Nil	
Exp.	V ...	60.0 per cent	
Exp.	VI ...	Nil	

In experiments IV and VI the vaccine appeared to exert no protective action at all, the vaccinated rats dying at about the same rate as the unvaccinated. Human tests of the vaccine of experiment III showed it to be of comparatively very mild toxicity on injection. But in view of the variability of the above results, it was not thought permissible to issue a vaccine grown at 37 deg. until it had satisfactorily passed further tests in a uniform way.

## F.—SECTION OF ENTOMOLOGY.

### 1.—Mosquitoes and Malaria.

Investigations connected with control of malaria have been carried out as follows :—

(a) *Nairobi*.—Routine collection of larvae and adults continued in connection with control measures carried out by the Medical Officer of Health. Owing to drought, mosquito catches have been abnormally low during most of the year.

(b) *Kisumu*.—Investigations connected with paris green control have progressed. Records indicate that the method is effective. Much permanent work has been carried out by the sanitary inspector. The area of investigation was enlarged to include the air port. Conditions are bad there. It is proposed to intensify our effort as soon as European staff becomes available. The lake shore, with its papyrus and grass, is undoubtedly responsible for the production of large numbers of *A. funestus*. The only satisfactory control is the abolition of vegetation, and the substitution of a permanent stone facing all round the gulf. This work has been started. We have recommended the construction of concrete watering places for people and cattle. The Senior Medical Officer proposes to improve on this with the erection of village pumps.

(c) *Kakamega*.—Intensive investigation and control has been started. Our records over some three years, combined with an intensive enquiry by Mr. J. O. Harper, Malarial Field Overseer, enabled us to suggest permanent measures which should eliminate township anopheline breeding completely, and reduce malaria to negligible proportions. The recommendations include concrete domestic and cattle watering places on suitable streams, and bridges or crossings of other suitable construction. Briefly, a control of all water sources, within and outside the township is being attempted. Temporary oiling is providing a check on mosquito output.

Inspections are being carried out on mining properties, and advice is given as to control measures. Mining operations are instrumental in increasing anopheline output (mostly *A. costalis*) enormously. Constant supervision, advice and pressure are needed to induce miners to drain or oil their pits and other excavations.



(d) *Kitui*.—Anti-malaria work was commenced by us in June last, though the Medical Officer had previously commenced small operations with the help of one of our African staff. We have made fairly comprehensive recommendations for permanent control measures and with two trained Africans the Medical Officer in charge was able to organize fairly thorough temporary oiling. An intensive effort is, however, necessary in this area of so many springs, seepages and streams.

(e) *Digo Reserve and Meru*.—Surveys and control have been continued by the Medical Officers with the help of members of our African staff. One African was posted to Kilifi in August for mosquito surveys under the Medical Officer in charge. All identifications have been dealt with in Nairobi.

(f) The tests of anti-malarial oils have been terminated and a report has been submitted. Results are briefly as follows :—

1. In Paraffin (Kerosene), Borneo and Persian Fuel oils and Solar oil, there is a loss of weight through volatilisation upon exposure to atmospheric conditions. Paraffin loses very heavily; Solar slightly. Loss measures with a rise of temperature. But there appears to be little, if any, direct correlation between such loss of weight and toxicity of vapours, since Borneo fuel and Solar vapours killed larvae almost as quickly as that of paraffin.

2. Larvae in contact with oils are immobilised and die more rapidly than when exposed to their vapours only. It is suggested that oils, particularly Fuels and Solar, depend for their action mainly upon actual penetration of larval spiracles.

3. Fuel and Solar oils appear to be better spreaders than Paraffin, and the addition of the latter in small quantities to either of the former decreased their spread.

4. Increase of temperature, or exposure to sunlight improved the kill value of oils in contact with larvae. Solar and Fuels of low volatility probably owe their increased action to a lowering of surface tension and viscosity, and a rapid penetration of spiracles.

5. Small dosages of oils are unsatisfactory; they do not last. In the field, dosages of 18 to 20 gallons per acre are effective if oiling is repeated every seven or eight days. Heavier dosages are necessary if the periods between successive applications are longer than this.

Heavier oils, with lower proportions of light oil (kerosene or Solar) should be used in districts with normal high temperatures.

6. Tests of oil fractions ('cracked' oil) indicated that material distilled off below 270 deg. C. is generally poor in lethal properties. Elimination of this material from anti-malarial oils would increase efficacy.

7. The best ones (fractions) tested, showed a specific gravity of .85 and over, medium to light viscosity, and a relatively high surface tension in one. They were all of a light wine to dark port in colour. It seems, therefore, that the important larvicidal properties of these oils depend upon the presence of certain quantities and qualities of residue produced by distillation above 270 deg. C.

8. Borneo Fuel appears to be slightly superior to Persian.

9. A mixture of Fuel 10 parts and Solar oil 1 part is recommended as a substitute for the Fuel and Paraffin mixtures now in use.

(g) Some three thousand microscopical examinations of glands of captured adults have been carried out during the year. We have still to find infections in species other than *A. costalis* and *A. funestus*.



## 2.—Tsetse-Fly and Sleeping Sickness.

(a) The clearings in Kaniadoto were continued. In October, Mr. Vane took over the work and commenced the trapping experiment for which funds have been provided from the Colonial Development Fund.

(b) The trapping experiment on Maboko Island has been continued. Two trained Africans have been in residence on the island. The results are very promising.

(c) Three clearings have been completed at Seme (Central Kavirondo), and four are being made at Kadimu. In connection with the latter, a scheme of agricultural development is being initiated by the Administration.

(d) Some small progress has been made in the preparation of baits for tsetse traps. We find that, against *G. palpalis*, testicular and mammary extracts of cattle have a decided value. Sebaceous gland extracts are also promising.

(e) Anti-sera of all the common game have been prepared, and tests have been carried out on large numbers of tsetse caught on Maboko Island. This work is continuing.

(f) We have been associated with recommendations for the control of a possible spread of sleeping sickness in many areas of Central and South Kavirondo. At our suggestion, most of the lake shore of Central Kavirondo has been excluded from the open prospecting area. Similarly, a long stretch of the Yala River, heavily infested with *G. palpalis*, is to be reserved for controlled exclusive prospecting only.

(g) We have kept in close touch with the Director and members of the Tsetse Research Department, Tanganyika. Visits were paid to this territory by the Director and two entomologists, whilst two Uganda officers interested in tsetse fly work, came for an informal discussion with Mr. Swynnerton and Mr. Symes on Maboko Island.

Fly boys on the staff of the Uganda Entomologist have been sent to Maboko Island for training in trapping and record making.

A case of European sleeping sickness occurred in a hunting party that had visited the Mara River area. *G. pallidipes* and *fuscipleuris*, but no infection, had previously been reported in this area. Whether there is a northward movement of fly (*G. palpalis*) from the Gori River as a result of the increased road transport, or of one of the morsitans group from Tanganyika is not yet known.

*G. austeni* has been captured at Meyorene (Digo Districts) and Mtondia (Kilifi district).

## 3.—Flies and Disease.

Considerable collections of flies have been made from human and wild animal faeces as a preliminary to a more intensive study of the role of flies in disease.

## 4.—Maggot Treatment of Ulcers.

Maggot extracts have been supplied to various hospitals during the year. A report from one Medical Officer indicated that the extracts at the strength then supplied (8 per cent) were not an advance on the ordinary treatments. A 30 per cent extract has been issued for test, but no report has yet been received.

Preparation of maggots and extract has ceased.

**G.—BIOCHEMICAL SECTION.****1.—Routine Work.**

The following table gives the number and nature of the routine examinations carried out during the year :—

*(a) Urines.*

General examination, i.e. reaction, specific gravity, albumin, sugar and deposit	...	...	...	905
Machan's urea concentration test	...	...	...	39
Albumin	...	...	...	27
Sugar	...	...	...	18
Sugar and albumin	...	...	...	7
Albumin and deposit	...	...	...	6
Urea	...	...	...	3
Deposit	...	...	...	2
Bence-Jones protein	...	...	...	2

*(b) Blood.*

Non-protein nitrogen	...	...	...	41
Sugar tolerance curves	...	...	...	15
Van den Bergh test	...	...	...	6
Sugar	...	...	...	5

*(c) Faeces.*

Occult blood	...	...	...	16
Fat	...	...	...	2
Bile acids and salts	...	...	...	1

*(d) Cerebro-spinal fluid.*

Globulin excess	...	...	...	15
Lange gold curves	...	...	...	7

*(e) Miscellaneous.*

Fractional test meals	...	...	...	22
Human milk	...	...	...	3
Ascitic fluid	...	...	...	1

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*Total number of examinations* ... 1,143

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The preparation of metallic bismuth was continued and during the year 194,885 doses were sent to Medical Stores for issue to Medical Officers. In addition, 22,675 doses of a suspension of bismuth oxide were prepared and issued.

**2.—Research Work.**

The analysis of locally grown foodstuffs was continued and with the help of the following gentlemen, samples were obtained from the districts mentioned :—

Dr. Harley-Mason—Kisii district.

The Principal, Waa School—Waa district.

Mr. J. Anderson—Ngong district.

Dr. C. R. Philip—Digo district.

The series, as completed at the end of the year, totalled 130, and grateful acknowledgment is made of the assistance rendered by these gentlemen.

Mr. Nefdt completed a series of 58 Lange gold curves on samples of cerebro-spinal fluid submitted by Captain R. P. Cormack from cases in Mathari Mental Hospital and since his return from leave, he has been engaged on the analysis of bones of East African natives with material supplied from post-mortem examinations by Dr. Vint.

Towards the end of the year, several preparations of tissue extracts were made for Dr. King of Nairobi for the treatment of neoplastic growths but time has not permitted of a study of their chemical composition.

## APPENDIX.

RESUME OF WORK CARRIED OUT BY THE CLINICAL LABORATORY  
ATTACHED TO THE NATIVE HOSPITAL, MOMBASA,  
DURING THE YEAR 1933.

## 1.—Staff.

*European.*—Mr. E. C. Young was in charge until October, 1933, when he proceeded to England on long leave, being relieved by Mr. W. L. Titman.

*African Staff.*—The African staff consisted of two trained African Laboratory Assistants.

## 2.—Examinations.

During the year, 12,275 specimens were received and dealt with in the Laboratory, an increase of 747 specimens over the previous year.

The sum of Sh. 1,270 was collected on account of examinations performed for medical practitioners engaged in private practice.

A detailed account of the work carried out is as follows :—

## 3.—Blood Examinations.

<i>Slides examined for malaria parasites</i>	...	...	...	...	5,169
(a) Negative	...	...	...	...	4,060
(b) <i>P. falciparum</i> including 31 crescents	...	...	...	...	812
(c) <i>P. malariae</i> alone	...	...	...	...	11
(d) <i>P. vivax</i> alone	...	...	...	...	11
(e) Mixed infections	...	...	...	...	20
<i>Other parasites.</i>					
(a) <i>S. rossi</i>	...	...	...	...	5
(b) <i>Microfilaria</i> , unsheathed	...	...	...	...	4
(c) <i>Microfilaria</i> , sheathed	...	...	...	...	26
<i>Other examinations.</i>					
(a) Total counts	...	...	...	...	44
(b) Differential counts	...	...	...	...	127
(c) Blood grouping	...	...	...	...	16
<i>Total</i>					<u>5,169</u>

## 4.—Faeces Examinations.

Three thousand six hundred and fifty-seven specimens of faeces were examined for helminths or protozoa. One thousand one hundred and four were negative and two thousand five hundred and fifty-three showed infection with one or both.

There has been a remarkable increase in the number of specimens in which *E. histolytica* has been identified, in European, Asian and African stools; this has been noticeably reduced since the advent of the rains. Protozoa have been found in greater numbers generally. Many infections with three or four helminths were found, the ova of *Ancylostoma duodenale* being the commonest.



The number of times the various helminths and protozoa were identified is as follows :—

<i>Ancylostoma duodenale</i>	...	...	...	...	1,528
<i>Trichuris trichiura</i>	...	...	...	...	1,077
<i>Ascaris lumbricoides</i>	...	...	...	...	830
<i>Taenia</i>	...	...	...	...	361
<i>Strongyloides stercoralis</i>	...	...	...	...	107
<i>Schistosomum mansoni</i>	...	...	...	...	79
<i>Oxyuris vermicularis</i>	...	...	...	...	19
<i>Hymenolepis nana</i>	...	...	...	...	2
<i>Schistosomum haematobium</i>	...	...	...	...	1
<i>Entamoeba coli</i>	...	...	...	...	608
<i>Entamoeba histolytica</i>	...	...	...	...	343
<i>Giardia intestinalis</i>	...	...	...	...	195
<i>Iodamoeba butschlii</i>	...	...	...	...	76
<i>Entamoeba nana</i>	...	...	...	...	1
<i>Chilomastix mesnili</i>	...	...	...	...	1
<i>Isospora hominis</i>	...	...	...	...	1
Flagellates (cysts and free forms—undifferentiated)	...	...	...	...	378
Other examinations	...	...	...	...	1

One specimen of faeces was tested for the presence of occult blood.

#### 5.—Serological Examinations.

(a) Widal's test was carried out on 159 samples of serum. Taking as a standard agglutination in a dilution of 1-50 or higher and using Dreyer's technique, the following were the results :—

Negative	...	...	...	...	110
<i>B. typhosus</i> alone	...	...	...	...	34
<i>B. paratyphosus</i> "A" alone	...	...	...	...	1
<i>B. paratyphosus</i> "B" alone	...	...	...	...	4
Group agglutinations	...	...	...	...	10

In addition, the following tests were carried out :—

<i>B. abortus</i>	...	...	Negative 11.
<i>Weil-Felix</i>	...	...	Negative 1.

(b) Two hundred and thirty-seven specimens of blood were received, the sera pipetted off and forwarded to Nairobi for the Wassermann, Kahn or Sigma test.

#### 6.—Bacteriological Examinations.

One hundred and seventy-five specimens requiring cultural examination were received. These were dealt with and forwarded to Nairobi, if necessary, for further investigation or vaccine preparation.

Faeces cultures	...	...	...	...	93
Urine	...	...	...	...	43
Blood	...	...	...	...	9
Throat swabs (one containing <i>B. diphtheriae</i> )	...	...	...	...	14
Miscellaneous cultures	...	...	...	...	14
Cerebro-spinal fluid cultures	...	...	...	...	2

7.—Microscopical Examinations.

(a) *Gonorrhoea*.—Two hundred and six specimens of urethral exudate were examined and eighty-six of these showed the presence of *Neisseria gonorrhoeae*.

(b) *Lymph from Chancres*.—One hundred and six specimens were examined. *S. pallida* was identified in twenty-five.

(c) *Leprosy*.—Seven nasal smears were examined, all of which proved negative.

(d) *Sputum*.—Four hundred and seventy-three specimens of sputa were received and examined as follows :—

Sputa negative for <i>M. tuberculosis</i>	...	...	...	326
Sputa positive for <i>M. tuberculosis</i>	...	...	...	144
Gram stain only	...	...	...	3

(e) *Plague*.—Four hundred and ninety-seven smears from rats either trapped or found dead were examined for the presence of *B. pestis*. All of them were negative.

(f) *Cerebro-spinal fluid*.—Nine specimens were received and examined with the following results :—

Cell counts	...	...	...	...	...	...	4
Sugar	...	...	...	...	...	...	2
Globulin	...	...	...	...	...	...	1
Presence of organisms	...	...	...	...	...	...	2
(both pneumococci)							

(g) *Anthrax*.—One exudate was examined and found to contain *B. anthracis*.

(h) *Miscellaneous smears*.—Sixty smears from various sources were examined. Noticeable among these were four in which the tubercle bacillus was identified—one in a pleural effusion, one in pus from the abdomen and two in pus from abscesses.

8.—Urines.

Two thousand two hundred and forty-three specimens of urine were received and examined as follows :—

General	...	...	...	...	...	...	2,203
Albumin content	...	...	...	...	...	...	6
Urea concentration test	...	...	...	...	...	...	5
For <i>N. gonorrhoeae</i> —negative	...	...	...	...	...	...	23
For <i>N. gonorrhoeae</i> —positive	...	...	...	...	...	...	2
For <i>M. tuberculosis</i> —negative	...	...	...	...	...	...	4

*Schistosoma haematobium* was found in thirty-eight specimens.

9.—Water Analyses.

Seven bacteriological examinations of water were carried out, six of the Mombasa water supply and one from a well. The preliminary results of these were forwarded to Nairobi with sub-cultures, where the examinations were completed.

10.—Pathological Specimens.

Twenty-six specimens were forwarded to Nairobi for histological examination.

11.—Miscellaneous—Sent to Nairobi.

- (a) Four protein free filtrates for non-protein nitrogen.
- (b) One stomach and contents for evidence of poisoning.
- (c) Seven cultures for vaccine preparation.









